FOREIGN AGRICULTURE CIRCULAR

OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
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FR 1-49

February 7, 1949

WORLD RICE EXPORT SUPPLIES INCREASE

The 1948-49 (August-July) world rice harvest is equal to prewar production for the first time since World II, according to the estimate of the Office of Foreign Agricultural Relations. The crop is sharply above that of 1947-48. Expressed in terms of milled rice, world production approximates 117,700,000 short tons compared with 111,300,000 the year before, and with 117,500,000 before the war (1935-36/39-40).

Supplies from the 1948-49 crop for export in 1949 are estimated at about 55 percent of prewar exports of 8,700,000 tons. A preliminary forecast of available supplies is 4,800,000 short tons, including shipments from Formosa to China, compared with about 4,000,000 tons in 1948.

The increase in supplies compared with the year before is due primarily to larger production and unexported stocks in the exporting countries of Asia. A near-record crop was harvested in Siam. Actual exportation during 1949 of all the surplus estimated in Burma and French Indochina is contingent upon the settlement of political disturbances in those countries.

Total availabilities in the countries of North America and Europe may exceed slightly the 1948 exports. Those from South American countries, however, are expected to drop below last year's shipments. Deliveries from Egypt may surpass the 1948 record.

Exporting countries

Siam, formerly the world's third most important exporter, is expected to be the primary source for rice exports in 1949. The 1948 acreage increased to over 90 percent of the prewar average, and weather favored the production of the largest crop since 1932, according to official statistics. Taking into account larger domestic requirements to meet the need of the population increase which has taken place since the war, the surplus for export is estimated at 1,375,000 short tons, or 88 percent of prewar exports. This compares with the shipment of about 850,000 tons in 1948, the largest since the war, and with 423,000 tons in 1947.

Before the war Burma was the most important exporter of rice, shipping more than one-third of the world exports. Until August 1948

that country showed the greatest promise for recovery toward prewar production and trade. Acreage had increased steadily, and yields per acre were good, with the result that about 1,650,000 tons were reported available for export in 1948. However, since August, political disturbances have restricted transportation and held up movement to ports. The result has been an accumulation of stocks in the interior of the country, and lack of rice at the ports for shipment abroad. The amount exported during 1948, therefore, was reduced to approximately 1,350,000 tons, a reduction of 300,000 tons below the amount reported to be actually available for delivery.

Burma's rice production is reported to be slightly less than in 1947-48. Supplies from the 1948-49 harvest plus some unexported stocks from last year's crop are estimated in the neighborhood of 1,700,000 tons. Delivery of this quantity, however, depends on whether or not it will be transported from the interior of the country to Rangoon, Bassein, and other ports.

The Burmese Government's target for 1949 exports late in December was 1,400,000 tons of milled rice. The shipment of that volume is reported to be problematical unless present political disturbances are settled.

Political unrest in French Indochina has retarded recovery of rice production and trade since the end of World War II. The 1948 exports are estimated at 200,000 tons, which is a sizable increase over the 75,000 tons exported in 1947, but is only 12 percent of prewar deliveries. The acreage of 1948 is believed to be larger than in the year before, but a September typhoon in Tonkin Province seriously damaged the crops. As this region is normally barely sufficient in rice, some of its requirements will probably be drawn from Cochin Province, reducing the surplus there. Total export availabilities, therefore, from Indochina may not exceed those of the current year unless the political situation improves.

Export supplies from the United States may be larger than in the preceding year, as another record crop was harvested. Mexico, El Salvador, and Nicaragua also are producing large crops, and export supplies from that region may approximate 55,000 tons, the largest on record. Production in the Dominican Republic was considerably larger than the preceding crop which was reduced by drouth, and some rice may be available for export. Haitian production, however, was reduced by dry weather, with a result that a scarcity may exist rather than the relatively small export surplus which is usually available from that country.

Egypt produced another record crop, and taking into consideration the amount of supplies which will not be substituted for wheat flour, as they were in 1948 when bread grains were in short supply, the export availabilities are estimated at about the same as in 1948, when the record volume of 330,000 tons were shipped abroad. Madagascar's production has declined in recent years, and because of the political conditions there, rather than exporting, that country is now importing rice.

Not quite so large a crop was produced in Italy as in the year before. Exports in 1948 are estimated at 50,000 tons, and at least that quantity

RICE (in terms of milled): World production and trade 1935-36 to 1939-40, estimated production and export supplies, 1948-49 a/

Continent and country	Estimated production 1935-36 to 1939-40	Estimated production 1948-49 b/	Apparent domestic disappearance 1936-1940	International trade: Prewar average Net imports	International trade: Prewar average Net exports	International trade: Export supplies 1949 b/
	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons
Western Hemisphere:						
North America:						
United States	729	1,187	622	-	107	450
Mexico	59	107	50	-	9	45
Estimated total	924	1,570	1,140	332	116	505
South America:						
Brazil	971	1,609	929	-	42	100
British Guiana	52	c/	35	-	17	25
Ecuador	50	c/	37	-	13	30
Estimated total	1,308	2,267	1,329	101	80	170
Total Western Hemisphere	2,232	3,837	2,469	433	196	675
Asia:						
French Indochina	5,039	3,938	3,429	-	1,610	200
Siam	3,356	3,938	1,896	-	1,460	1,375
Burma	5,489	4,166	2,221	-	3,268	1,700
China	41,318	37,170	41,729	411	-	-
Japan	9,385	9,072	11,331	1,946	-	-
Korea	3,083	d/2,421	2,022	-	1,061	-
Formosa	1,350	1,169	641	-	709	e/ 400
Philippines	1,652	1,874	1,717	65	-	-
Malayan Union	427	425	1,206	779	-	-
Netherlands Indies f/	6,960	c/	7,172	212	-	-
Indian Union	g/22,112	24,412	(32,290	(1,552	-	-
Pakistan	g/ 8,626	8,978				
Others	3,423	c/	4,486	1,095	30	45
Estimated total	112,200	109,700	110,100	6,060	8,140	3,720
Europe:						
Italy	550	468	382	-	168	65
Estimated total	777	792	2,053	1,446	170	65
Africa:						
Egypt	522	1,024	390	-	132	330
Estimated total	1,699	2,651	1,998	455	156	340
Estimated world total	117,500	117,700	117,200	8,400	8,700	4,800

a/ For countries of Asia and Africa, rough rice is converted to terms of milled at 70 percent, and for other countries at 65 percent. b/ Preliminary. c/ Statistics not yet available. d/ South Korea only. e/ Available for shipment to China. f/ Estimate for all Netherlands Indies. g/ Less than 5-year average.

Compiled in the Office of Foreign Agricultural Relations.

should be available in 1949.

Iran produced a large crop, from which exports are expected to amount to at least 45,000 tons. Reduced production restricted exports to only 17,000 tons in 1948, compared with average exports of around 65,000 tons. The major part of Iran's supplies usually are exported to the U.S.S.R.

Australia's acreage planted was expected to be slightly larger than in 1948, and exports may again approximate 30,000 tons.

Prices since 1947 which were considered unprofitable have resulted in some decline in the acreage of South American countries. The shipment of all carry-over stocks during 1948 from the large 1947 harvests, combined with reduced crops this year, is expected to result in a sharp drop in export supplies of rice from the countries of that continent during 1949.

This is true especially in Brazil and Ecuador, the two most important rice-exporting countries of South America. Chile's 1948-49 acreage dropped sharply, and that country can no longer be counted upon to export rice. The availabilities from British Guiana probably will be as large or larger than in 1948. According to a trade agreement, the British West Indies will import all of these supplies.

Importing countries

The major part of the increase in world production of 1948-49 occurred in the importing countries of Asia. Weather generally has been favorable for rice production, especially in Japan, Korea, and the Philippines. Larger crops also are being produced in China, the Indian Union, Formosa, and Ceylon.

The countries having the greatest need for rice are those which had the largest imports before the war--Japan, India, Ceylon, Malaya, China, and the Netherlands Indies. Production in these countries, although the largest since the war, with the exception of India and Pakistan is not yet up to prewar levels. Population increases in some countries, particularly in Japan, also pose the problem of increased needs.

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WORLD RICE PRODUCTION AGAIN EQUAL TO PREWAR

The world rice harvest of 1948-49 (August-July) approximates prewar average production for the first time since World War II, according to the estimate of the Office of Foreign Agricultural Relations. The crop of 7,470 million bushels is a pronounced increase over the 7,060 million in 1947-48 and almost identical with the 7,450 million bushels produced during the prewar (1935-36/39-40) period.

This season's good harvest is due to favorable weather in many countries and to an increase in the area planted. The largest gain in production occurred in Asia. Record crops were produced, however, in Africa, North America, and Europe. South American output is expected to exceed that of last year, but to be less than the peak production of 2 years ago.

The world acreage planted to rice is the largest on record. This is true in Asia as well as in the other continents where acreages increased as a result of the war. The gain in acreage over prewar in Asia is primarily in the Indian Union and Pakistan, for in most of the countries planting has not recovered to the prewar average. Cultivation of poorer lands in some producing areas and fertilizer shortages in the countries of Asia and Europe caused a drop in yields per acre compared with prewar.

Asia's production is estimated at 7,000 million bushels compared with 6,600 million 1947-48 and 7,100 million before the war. It is 6 percent larger than the preceding year's crop, and 98 percent of the prewar average production.

Favorable weather was the principal factor in the production of large harvests in Asia's net-importing countries, China, India, Japan, the Philippines, and Korea. Growing conditions were favorable also in the surplus-producing countries, Siam, Burma, and French Indochina. Production in Burma and French Indochina was again substantially below the prewar average.

China's acreage increased slightly in 1948, weather conditions generally were favorable, and another good crop was harvested. Production is estimated at 2,360 million bushels compared with 2,278 million a year earlier and with 2,623 million bushels before the war.

ROUGH RICE: Acreage, yield per acre, and production in specified countries, averages 1930-31 to 1939-40, annual 1946-47 to 1948-49 a/

Continent and country	Acreage: Average 1930-31 to 1934-35	Acreage: Average 1935-36 to 1939-40	Acreage: 1946-47	Acreage: 1947-48 b/	Acreage: 1948-49 b/	Yield per acre: Average 1935-36 to 1939-40	Yield per acre: 1948-49 b/	Production: Average 1930-31 to 1934-35	Production: Average 1935-36 to 1939-40	Production: 1946-47	Production: 1947-48 b/	Production: 1948-49 b/
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Bushels	Bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels
NORTH AMERICA:												
Costa Rica	-	c/ 28	33	30	30	c/ 33.4	33.4	917	935	1,120	952	1,003
El Salvador	22	26	-	42	71	26.9	35.6	530	700	1,368	-	2,525
Mexico	84	95	157	183	183	42.2	40.2	3,478	4,007	6,760	6,752	7,350
Panama	35	50	105	122	130	32.0	22.8	960	1,600	2,709	2,594	2,965
United States	883	1,004	1,574	1,693	1,743	49.7	46.6	41,572	49,852	72,216	78,259	81,170
Cuba	36	45	107	105	123	21.4	24.4	935	965	2,400	2,870	3,000
Dominican Republic d/	45	80	124	100	92	36.3	45.1	1,517	2,905	3,684	3,840	4,150
Trinidad	7	10	22	-	-	30.0	-	180	300	844	-	-
Total	1,200	1,430	2,320	2,460	2,580	-	-	51,340	63,200	94,630	101,390	107,330
EUROPE:												
Bulgaria	18	19	14	-	-	54.8	-	791	1,041	500	-	-
France	1	1	2	6	12	30.0	41.7	35	30	118	245	500
Italy	360	362	325	348	350	103.9	91.4	34,139	38,620	26,000	34,300	32,000
Portugal	40	51	64	69	77	66.6	54.1	1,820	3,398	3,068	4,165	4,165
Spain	117	110	125	130	137	e/ 124.4	97.1	14,558	10,600	10,070	12,740	13,300
Total (excl. U.S.S.R.)	540	560	560	600	660	-	-	51,480	53,150	40,720	54,040	54,140
U.S.S.R. (Europe and Asia)	328	c/ 384	335	-	-	c/ 42.3	-	10,785	c/ 16,225	-	-	-
ASIA:												
Iran	c/ 560	c/ 534	545	545	545	c/ 37.1	39.6	c/ 22,413	18,577	20,576	15,607	21,560
Iraq	c/ 316	c/ 386	-	-	-	c/ 27.3	-	c/ 7,750	11,176	14,200	12,740	16,500
Syria	1	2	19	20	-	55.5	-	45	111	964	1,057	735
Turkey	66	78	45	56	62	61.2	71.0	3,329	4,774	2,976	3,720	4,400
Burma	12,770	12,671	7,788	9,154	9,854	27.5	26.8	358,219	348,534	194,942	270,547	264,500
China	c/ 47,099	c/ 48,161	45,165	45,373	45,617	c/ 52.5	51.7	2,345,574	2,623,383	2,253,921	2,278,436	2,360,000
Formosa	1,609	1,616	1,435	1,631	1,700	53.0	43.6	75,340	85,704	59,015	71,727	74,200
Manchuria	472	782	400	-	-	40.6	-	14,923	31,783	15,000	-	-
French Indochina	13,505	14,306	9,750	10,650	11,000	22.4	22.7	281,497	319,910	210,000	235,000	250,000
Indian Union f/	70,288	g/ 54,105	60,987	59,656	61,000	g/ 25.9	25.4	1,995,645	g/ 1,403,935	1,484,057	1,402,141	1,550,000
Pakistan		g/ 18,686	20,959	21,156	21,457	g/ 29.3	26.6		g/ 547,702	579,616	569,900	570,000

ASIA: (Cont'd.)												
Japan	7,887	7,862	7,700	7,830	7,850	75.8	73.4	557,217	595,845	561,076	553,408	576,322
Korea	4,112	3,838 h/	2,712 h/	2,753 h/	2,782	51.0 h/	55.3	197,500	195,763 h/	114,792 h/	131,983 h/	153,722
Malayan Union	740	746	797	862	900	36.3	30.0	25,333	27,099	20,322	26,868	27,000
Netherlands Indies i/	9,140	9,794	8,850	9,000	-	32.0	-	276,935	313,144	270,000	275,000	-
Philippine Islands	4,643	4,852	4,816	5,007	5,160	21.6	23.1	105,025	104,877	107,689	109,782	119,000
Siam	7,141	7,088	5,500	6,700	7,100	30.1	35.2	231,402	213,079	170,000	230,000	250,000
Total (excluding U.S.S.R.)	190,820	196,900	191,360	195,280	199,190	-	-	6,806,550	7,122,050	6,455,670	6,581,000	6,965,000
SOUTH AMERICA:												
Argentina	25	52	122	128	128	59.8	57.0	1,054	3,112	5,928	5,497	7,300
Brazil	2,074	2,323	4,166	3,756	4,082	28.6	27.0	58,970	66,424	132,779	101,164	110,051
British Guiana	78	70	98	101	91	50.8	58.2	3,445	3,559	4,993	4,742	5,300
Chile	-	13	80	70	58	99.9	75.9	18	1,299	4,274	4,381	4,400
Colombia	c/ 114	-	-	-	-	-	-	c/ 2,508	3,378	5,476	6,439	-
Ecuador	-	-	-	-	-	-	-	2,330	3,417	8,945	7,857	-
Paraguay	c/ 4	10	12	10	20 c/	46.0	-	c/ 175 c/	460	367	416	-
Peru	126	107	130	160	-	42.8	-	4,551	4,578	6,500	9,400	-
Surinam	c/ 29	37	40	-	-	46.0	-	1,078	1,703	2,507	1,889	-
Uruguay	3	13	23	29	-	66.6	-	201	866	1,723	2,009	-
Total	2,580	2,960	5,370	4,970	5,240	-	-	74,940	89,440	175,340	144,740	155,000
AFRICA:												
Belgian Congo	- c/	220	297	-	- c/	11.2	-	- c/	2,475	4,409	-	-
Egypt	352	463	656	805	815	71.6	79.8	20,876	33,155	45,971	62,533	65,000
French West Africa	1,065 c/	1,562	-	-	- c/	13.4	-	18,087 c/	20,936	-	-	-
Madagascar	1,354	1,195	1,430	1,430	-	28.3	-	35,166	33,823	34,290	34,290	-
Sierra Leone	307	340	-	-	-	26.8	-	9,015	9,100	-	-	-
Total	3,560	4,210	6,930	7,020	7,110	-	-	87,410	107,850	146,800	163,080	168,290
OCEANIA:												
Australia	21	23	32	26	32	92.0	93.4	1,629	2,117	2,751	2,489	2,990
Fiji	10	10	25	-	-	43.1	-	480	431	924	-	-
Total	40	40	90	80	90	-	-	2,200	2,700	4,800	4,660	5,160
World total	199,100	206,500	207,000	210,800	215,300	-	-	7,085,000	7,455,000	6,929,000	7,064,000	7,473,000

a/ Crops harvested in Northern Hemisphere countries during the latter part of the year, together with those harvested in Asia principally from November to May, are combined with crops harvested in Southern Hemisphere countries during the first part of the following year. b/ Preliminary. c/ Less than 5-year average. d/ Calendar year prior to 1946-47. e/ Average 1930-34. f/ Includes acreage and production in areas regularly reported only. g/ Average 1936-37/38-39. h/ South Korea only. In the 1935-39 period, production in South Korea averaged about 150,000,000 bushels. i/ Java and Madura only.

Office of Foreign Agricultural Relations. Prepared or estimated on the basis of official statistics of foreign governments, reports of the United States Foreign Service officers, results of office research, and other information.

The Indian Union is expected to harvest about 1,550 million bushels, the largest crop in several years. This compares with 1,402 million the year before, and with 1,404 million bushels before the war. The acreage of Pakistan exceeded early expectations, but only average yields were being harvested as the result of flood damage in some places, and the crop is expected to approximate 1947-48 production, or about 570 million bushels. Prewar output amounted to about 550 million bushels.

Exceptionally favorable growing conditions in Japan and Korea resulted in the largest harvests since the war. Japan's production of 576 million bushels was nearly up to the prewar average, and the record crop of South Korea was about 3 percent above prewar average production. Nearly 155 million bushels were produced compared with 132 million the preceding year and with an average of 150 million bushels before the war. These large crops were harvested despite decreased availabilities of fertilizers compared with prewar.

Estimates of the crops in Asia's export area, Siam, Burma, and French Indochina, indicate total production is about 88 percent of prewar average output. Nearly 770 million bushels produced compare with 740 million in the preceding year and with 880 million bushels before the war. The production of Siam exceeds the prewar average, according to official statistics. Favorable weather is reported to have resulted in an increase in the yields per acre and area harvested.

Burma's acreage is reported to have increased about 8 percent over that of last year, but the yields per acre are less. Production, therefore, is forecast at slightly less than in the year before, according to Burmese statistics. Acreage and production are reported at 78 and 76 percent, respectively, of the prewar average.

Although political unrest in French Indochina prevented an increase in acreage, the weather there was favorable, and relatively high yields per acre were reported. The crop is less than 80 percent of the prewar average output.

Europe's production is estimated at 54 million bushels, the same as in the preceding year. The output is only slightly larger than prewar harvest of 53 million bushels. The acreage was increased 15 to 20 percent over the prewar average and was about 10 percent larger than in the year before. Decreased application of fertilizers compared with prewar, however, caused substantial reductions in harvested yields per acre. Growing conditions were not so beneficial as in 1947, and production is only about equal to that of last season.

The Italian rice acreage was about equal to that of last year. The weather, however, although favorable, was not quite so ideal for production as in the preceding year, and the crop was slightly smaller. The harvest was approximately 15 percent less than prewar production.

Spain harvested the largest crop in several years. This was made possible, however, only through a substantial increase in acreage, as postwar yields per acre have been equal to only about three-fourths of

prewar yields largely as the result of a fertilizer shortage. The acreage in Portugal was again increased and another large crop was harvested.

African production set another record this season. About 168 million bushels were harvested compared with 163 million in 1947-48 and with 108 million bushels before the war. This was primarily the result of a larger harvest in Egypt than was forecast early in the season. That country planted and harvested a larger crop than last year's bumper crop. Production amounted to 65 million bushels compared with 63 million in the year before and with 33 million bushels before the war. Political unrest in Madagascar continues to prevent any gain in the planting and harvesting of the rice acreage.

The largest crop on record was harvested in North America. Production is estimated at 107 million bushels compared with 101 million in 1947-48 and with 63 million bushels before the war. A record crop was produced in the United States for the third successive year. The acreage was increased 3 percent and production, 4 percent over that of 1947.

Mexico also harvested its largest crop. The acreages of Central American and Carribean countries were increased, and record production was harvested in El Salvador, Nicaragua, Panama, and Cuba.

The acreage planted in South American countries is larger and the outturn is expected to exceed that of 1947-48. Production is forecast at 155 million bushels compared with 145 million in the year before and with 89 million bushels before the war. The acreage of Brazil was increased 9 percent, but dry weather in some areas again lowered the yields per acre, and production is forecast at 110 million bushels compared with 101 million in 1947-48 and with 66 million bushels before the war.

British Guiana is expected to have a record rice crop. Favorable growing conditions helped production and an increase in the practice of transplanting rice raised the total yield per acre. The acreage of Chile dropped 17 percent because of unfavorable prices, but higher yields harvested in 1947-48 may result in a crop about equal to that of last year.

Shortage of irrigation water in Peru is resulting in a drop in acreage and production. Argentine plantings were about the same as in the year before, and the harvest is expected to exceed 1947-48. Paraguay acreage about doubled and good yields per acre are expected. The acreage of Uruguay about equalled last year's which was substantially above average.

This is one of a series of regularly scheduled reports on world agricultural production prepared by the Office of Foreign Agricultural Relations Committee on Foreign Crop and Livestock Statistics. For this report, the Committee was composed of Joseph A. Becker, Chairman, C. M. Purves, L. Thelma Willahan, and Afif I. Tannous.

FOREIGN AGRICULTURE CIRCULAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
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BURMA: RICE PRODUCTION AND TRADE, 1948-49

The 1948-49 rice crop of Burma is estimated at 266 million bushels of rough rice, or slightly less than 271 million in the year before, in the final official forecast. This new crop is slightly more than 75 percent of prewar (1935-36/39-40) average production of 349 million bushels.

The acreage likely to mature is forecast at 9,958,000 acres compared with 9,154,000 in the year before, indicating continued recovery in the planting of rice toward the prewar average planted acreage. The yield harvested per acre is less than in the year before, however, when above-average yields were produced. Rice growing has shown the greatest postwar recovery in areas where insurgent activities have been practically non-existent, and less gain in the more important States of production in Lower Burma, where these activities have been centered.

BURMA: Rice production, trade, and apparent disappearance, 1938-39/40-41 and 1945-46/48-49

Year	Acreage	Yield per acre	Production: Rough	Production: Milled equivalent	Exports a/	Apparent disappearance a/
	1,000 acres	Bushels	1,000 Bushels	Million pounds	Million pounds	Million pounds
1938-39	12,842	28.1	360,535	11,357	7,491	3,866
1939-40	12,432	25.2	313,787	9,884	5,991	3,893
1940-41	12,819	30.7	393,760	12,403	7,300 b/	5,103
1945-46	6,893	19.5	134,455	4,235	960	3,275 c/
1946-47	7,788	25.0	194,942	6,141	1,779	4,362 c/
1947-48	9,154	29.6	270,547	8,522	2,725	5,797
1948-49	9,958	26.8	266,401	8,392	3,400 d/	4,992

a/ Calendar year following December harvest. Exports include rough rice converted to terms of milled at 70 percent.
b/ Unofficial estimate.
c/ Does not include carry-over stocks.
d/ Exportable surplus.

Compiled from official statistics and consular reports.

Exportable supplies from the current crop plus unexported stocks are estimated at about 3,400 million pounds. Delivery of this quantity, however, depends on whether or not it will be transported from the interior of the country to the ports. The Burmese Government's target for 1949 exports at the beginning of 1949 was 2,800,000 million pounds of milled rice. The shipment of that volume is reported to be doubtful unless present political disturbances are settled.

BURMA: Rice (milled) exports, by country of destination, 1939-November 1941 and 1946-48

Country of destination	1939	1940	January-November 1941	1946	1947	1948
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
ASIA:						
India	4,584	3,031	2,474	534	767	1,110
Ceylon	816	779	859	97	246	684
Malaya	458	477	788	267	298	443
Neth. Indies	169	a/	a/	32	106	132
Borneo	a/	a/	a/	2	10	23
Hong Kong	16	62	544	28	207	82
China	16	116	532	0	126	136
Japan	17	1,010	1,029	0	0	0
Other Asia	185	40	24	0	13	9
Total Asia	6,261	5,515	6,250	960	1,773	2,619
EUROPE:						
United Kingdom	134	150	370	0	6	76
Other Europe	288 b/	1	a/	0	0	5
Total Europe	422	151	370	0	6	81
CARIBBEAN:						
Brit. W. Indies	83	75	85	0	0	0
Cuba	3	9	10	0	0	0
Total Caribbean	86	89	95	0	0	0
Canada	28	9	a/	0	0	0
Mauritius	50	73	43	0	0	25
Other Countries	496 c/	98 c/	226 c/	0	0	0
Total	7,343	5,935	6,984	960	1,779	2,725

a/ Not separately reported.
b/ To Germany.
c/ May include rice to any of the above areas.

Compiled from consular reports.

Rice intended for export must be delivered from the producing areas in the interior by river or rail to the ports. Eighty-seven percent is moved to the principal ports of Rangoon and Bassein, and the remainder to Akyab and Moulmein. The movement of rice has been difficult since July 1948 due to the outbreak of large-scale insurgent activities, mainly in Lower Burma. As a result, stocks on hand at the ports were reduced and the 1948 export program fell below schedule after July.

Burma is still the world's largest exporter of rice, having in 1948 exported about thirty-eight percent of the total entering international trade. Deliveries showed an increase from 1946 until August 1948, when political difficulties caused a reduction in exports. Major destinations were India, Ceylon, and Malaya. Rice was exported to Europe, primarily to the United Kingdom, for the first time since the war.

The rice-milling capacity of Burma, although partly restored, now is considerably less than before the war. The capacity dropped in 1945 to less than one-third of the prewar average of 22,000 million pounds, and in 1948 about fifty-five percent of prewar capacity had been resumed. Most of the larger mills are located near the ports of Rangoon and Bassein and cater to export trade.

Prices paid to producers are about 350 percent higher than before the war. Retail prices in Rangoon are up proportionally. Export prices which averaged $1.29 to $1.51 per 100 pounds before the war now are from $6.29 to $7.19 per 100 pounds.

BURMA: Export price of milled rice, per 100 pounds, 1947-48 with comparisons

Year August-July	Rangoon No.2 in London	Year August-July	Rangoon No.2 in London	Year August-July	Rangoon No.2 in London	Year August-July	Rangoon No.2 in London
	Dollars		Dollars		Dollars		Dollars
1919-20 a/	6.14	1925-26	3.36	1932-33	1.13	1939-40	1.73 b/
-	-	1926-27	3.23	1933-34	1.35	-	-
1920-21	3.77	1927-28	3.04	1934-35	1.67	1940-41	2.01 b/
1921-22	2.98	1928-29	2.88	-	-	-	-
1922-23	2.78	1929-30	2.66	1935-36	1.69	1945-46	5.04 c/
1923-24	2.91	-	-	1936-37	1.91	1946-47	6.18 c/
1924-25	3.18	1930-31	1.83	1937-38	1.95	1947-48	6.81 c/
-	-	1931-32	1.46	1938-39	1.65	-	-

a/ Prices fixed by the Government.
b/ Approximate.
c/ "Small mills specials," f.o.b. Rangoon.

Compiled from International Yearbook of International Statistics and consular reports.

The principal type of rice exported in 1947 and 1948 was "small mills special," a short-grain grade, with 38 to 42 percent brokens. Other types were white broken, and "Sughandi," a long-grain rice. These three types have comprised Burma's main export trade since the war, whereas before the war various other grades were exported.

BURMA: Export prices, per 100 pounds, f.o.b. Rangoon, 1945-46/47-48 (July-June)

Type	1945-46	1946-47	1947-48
	Dollars	Dollars	Dollars
Sughandi	-	6.27	7.08
Parboiled	4.17	6.18	7.00
White rice	3.67	6.18	6.81
Ngatsein	5.04	6.18	6.81
White broken rice	2.30	3.78	4.58
White broken bran	1.62	1.98	1.97

Consular Report.

Based in part upon a report by Robert E. Clifford, Rangoon, Burma.

FOREIGN AGRICULTURE CIRCULAR

OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

FR 4-49 March 14, 1949

BRAZIL INCREASES RICE PRODUCTION; SURPLUS LESS

Brazil is the leading producer of rice in the Western Hemisphere. It normally consumes more than 90 percent of domestic production. The United States ranks second to Brazil in output, but exports a larger volume of rice to foreign markets.

The 1949 rice crop of Brazil may approximate 115 million bushels of rough rice, a gain of 7 percent over the 107 million bushels produced the year before, according to information received from Porto Alegre. If this estimate is realized, it will be nearly 50 million bushels (1,400 million pounds) larger than the average prewar rice production of Brazil.

Crop information indicates generally favorable growing conditions thus far in the producing States, except in Sao Paulo. The area planted in Rio Grande do Sul, the principal exporting State, is reported greater than that of the previous year. The increase is attributed to the disposal of previous carry-over stocks at satisfactory prices.

BRAZIL: Rice production by States, average 1936-40, annual 1946-49

State	Average 1936-1940	1946	1947	1948 a/	1949 a/
	Million bushels	Million bushels	Million bushels	Million bushels	Million bushels
Sao Paulo	19.2	46.5	42.0	26.5	30.1
Rio Grande do Sul	14.2	31.7	33.8	29.1	31.8
Minas Gerais	16.9	25.4	24.8	23.0	23.0
Goias	5.1	11.3	9.2	7.7	8.6
Parana	0.7	3.1	3.8	3.7	3.9
Santa Catarina	1.8	4.0	3.7	3.0	3.7
Maranahao	1.3	2.3	3.5	3.4	3.2
Rio de Janeiro	2.0	2.9	2.4	1.9	2.2
Others	5.2	8.6	9.6	8.4	8.5
Total	66.4	135.8	132.8	106.7	115.0

a/ Unofficial estimates.

Source: Anuario Estatistico do Brasil, except as noted.

The acreage of Sao Paulo also exceeded that of the year before, but low rainfall in some areas has caused a reduction in the prospective harvest. The latest available estimate indicates that although the acreage planted has increased about 25 percent, the harvest will be only 10 to 15 percent greater than in the year before.

BRAZIL: Rice production and exports, average 1926-40, annual 1945-49[a]

Year	Acreage	Yield per acre	Production: Rough	Production: In terms of milled	Net exports	Production minus exports
	1,000 Acres	Bushels	1,000 bushels	Million pounds	Million pounds	Million pounds
Average:						
1926-30	-	-	44,889	1,247	28	1,219
1931-35	2,074	28.4	58,970	1,725	110	1,615
1936-40	2,323	28.6	66,424	1,943	83	1,860
Annual:						
1945	3,702	28.4	105,182	3,077	195	2,882
1946	4,154	32.7	135,796	3,972	335	3,637
1947	4,166	31.9	132,779	3,884	546	3,338
1948[b]	3,756	28.4	106,651	3,120	456	2,664
1949[b]	4,082	28.2	115,000	3,360	200	3,160

a/ Rough rice of production and where occurring in trade is converted to terms of milled at 65 percent.

b/ Unofficial estimates.

Compiled from official statistics, except as noted.

Exportable supplies from Brazil's 1949 crop are estimated at from 200 to 300 million pounds. This is a sharp decrease from the 456 million pounds exported in 1948 and is due to the lack of carry-over supplies from the preceding year's crop. About 65 percent of 1948 exports were of carry-over stocks from the large 1947 harvest. Most of the exportable supplies were shipped during the early part of 1948, and consequently rice will not be available for export in large quantity until the new crop is ready for market in June 1949. Export availabilities during the first half of 1949 may amount to 45 million pounds.

The domestic rice supplies of Brazil will continue to be scarce until the new crop is harvested. Current prices, therefore, are relatively high. Stocks in Rio Grande do Sul, the nation's only surplus area, are sufficient only to meet local consumption needs and permit some shipments to Rio de Janeiro until the 1949 crop is marketed. Stocks in Sao Paulo may be exhausted before harvest-time, despite the quantities brought in from Rio Grande do Sul since August.

Prices in Rio Grande do Sul in recent months have been at high levels. The Price Control Mission of that State has attempted to hold prices at $7.47 to $9.08 per 100 pounds to the retailer. In Sao Paulo the reduced crop of 1948 and exports in the first part of that year caused a rise in prices to producers for rough rice from $5.40 per 100 pounds in June to $6.54 in November, and an advance in milled rice prices from $9.01 to $10.69 per 100 pounds.

Rice (milled): Wholesale prices, per 100 pounds, at Rio de Janeiro, January 1949

Type	Area of production	Price
		Dollars
Long-grain:		
Amarelao (agulha) - extra	Central States	14.33 - 14.74
" " - special	" "	13.52 - 13.93
Agulha - special	Sao Paulo	13.12 - 13.32
Amarelao (agulha)	Rio Grande do Sul	12.11
Agulha - special	" " " "	11.71 - 11.91
" "	Para	10.29 - 10.50
Short-grain:		
Blue Rose - extra	Rio Grande do Sul	11.11 - 11.30
" " - special	" " " "	10.50 - 10.70
Japanese - extra	" " " "	10.50 - 10.90
" - special	" " " "	9.89 - 10.09
" - 1st grade	" " " "	9.49 - 9.69
Maranhao - round grain	Maranhao	8.68 - 8.88

Press reports.

Rice exports from Brazil in 1948 came to 456 million pounds as against the previous year's record of 546 million pounds. Shipments, nevertheless, were more than four times as great as prewar average trade. Exports from 1931 to 1935 averaged 110 million pounds annually. During the 1936-40 period, the average was 84 million pounds.

Markets for Brazilian rice have changed in war and postwar years. Of the prewar (1936-40) exports, 64 percent was delivered to Western Hemisphere countries, and 36 percent to European, with none to Asia or Africa. Nearly 65 million pounds of rough rice was exported to Argentina, and was milled in Argentine mills.

BRAZIL: Rice (milled) exports by country of destination, 1947 and 1948

Continent and country	Exports 1947	Exports 1948	Continent and country	Exports 1947	Exports 1948
	Million pounds	Million pounds		Million pounds	Million pounds
ASIA:			EUROPE, Cont'd.		
Ceylon	135	a/60	Holland	1	8
India	75	136	Total	123	34
Malayan Union	63	56	WESTERN HEMISPHERE:		
Netherlands Indies	-	43	Br. West Indies	-	18
China	10	-	Venezuela	31	9
Lebanon	23	-	Bolivia	11	-
Palestine	-	6	Fr. West Indies	11	9
Syria	9	15	Panama	6	-
Transjordan	2	-	Curacao	2	-
Total	317	316	French Guiana	1	-
EUROPE:			Cuba	-	7
Portugal	39	-	Uruguay	-	1
Belgium	31	15	Total	62	46
Switzerland	26	1	AFRICA:		
Spain	7	-	Reunion Islands	-	15
Lithuania	6	-	Fr. West Africa	35	19
United Kingdom	6	-	Un. of So. Africa	9	14
Czechloslovakia	4	2	Madagascar	-	11
Trieste	-	3	Liberia	-	1
Italy	3	-	Total	44	60
Bizone	-	5	TOTAL EXPORTS	546	456

a/ British Empire.

American Consulate, Porto Alegre.

The 1936-40 exports to Western Hemisphere countries in terms of milled rice averaged 54 million pounds, as follows (million pounds): Argentina, 42; Bolivia, 4; and Peru, Chile, Venezuela together, 8. Exports of 30 million pounds to European countries averaged (million pounds): France, 9; Germany, 8; Belgium, 5; Switzerland, 2; Sweden, 2; United Kingdom, 2; and others, 2.

Owing to the world shortage of rice in war and postwar years, Brazil's product since the war has been marketed in all the continents. Nearly 70 percent of the total in 1948 was delivered to Asia, 13 percent to Africa, 7 percent to Europe, and 10 percent to the Western Hemisphere. The total amount shipped to Western Hemisphere and European countries approximated prewar exports.

The principal destinations of 1948 exports in the Western Hemisphere were the British West Indies, French West Indies, Venezuela, and Cuba. None was exported to Argentina. The West Indies and Cuba before the war were supplied by Burma and Siam. During the war Argentina, traditionally Brazil's best market, developed its domestic industry to supply its needs and in some years exported small quantities of rice.

Rio Grande do Sul

The State of Rio Grande do Sul supplies about 85 to 95 percent of Brazil's rice exports, although it usually produces less than 30 percent of the total crop. Its planted acreage to be harvested in 1949 is reported to have increased about 8 percent over that of the year before. This gain is attributed to the rising prices as the result of Brazil's rice shortage in the latter part of 1948. The weather to date has been favorable for the production of a large crop which will be harvested from March to May.

Rio Grande do Sul during 1948 shipped an unusually large volume to other Brazilian markets. Record quantities were shipped to the Federal District and to the States of Rio de Janeiro, Bahia, Pernambuco, and Espirito Santo. These heavy shipments to the other areas of Brazil were possible as the result of the large carry-over stocks held at the beginning of 1948.

RIO GRANDE DO SUL: Rice shipments to Brazilian States, 1948 with comparisons

State	Average 1936-40	1944	1945	1946	1947	1948
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
Federal District...	136	136	145	142	113	(280
Rio de Janeiro.....	9	8	13	21	53	(
Sao Paulo.....	84	5	2	0	0	a/ 53
Parana.....	12	6	8	1	0	a/ b/
Bahia.....	7	8	13	21	16	17
Pernambuco.....	9	10	17	21	17	22
Others.....	13	11	18	30	36	a/ 45
Total shipments..	270	184	216	236	235	477
Foreign exports..	71	298	160	309	214	392
Shipments and exports.....	341	482	376	545	449	869

a/ Does not include approximately 60 million pounds shipped to Sao Paulo and Parana by rail.
b/ Not separately reported.

Rio Grande do Sul Rice Institute.

FOREIGN AGRICULTURE CIRCULAR

OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

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PHILIPPINE RICE PRODUCTION INCREASES

The Philippines in 1948-49 produced a near-record rice crop, the largest since World War II, according to the final official estimate. Production is estimated at 118 million bushels compared with 110 million in the year before. The average annual output during the 1935-36/39-40 period was approximately 105 million bushels, and the harvests in the years 1939-40 to 1942-43 ranged from 113 to 120 million bushels a year.

Weather conditions during the 1948-49 season were generally favorable for rice production. The harvested acreage was 5 percent greater than in the year before, and the yields produced per acre were the highest in 6 years. Harvesting was nearly completed at the end of January.

PHILIPPINES: Rice production and imports, averages 1930-31/39-40, annual 1940-41/42-43 and 1945-46/48-49 1/

Year	Acreage	Yield per acre	Production: Rough	Production: In terms of milled	Imports 2/	Production plus Imports 2/
	1,000 acres	Bushels	1,000 bushels	Million pounds	Million pounds	Million pounds
Average:						
1930-31/34-35	4,643	22.6	105,025	3,308	21	3,329
1935-36/39-40	4,852	21.6	104,877	3,304	130	3,434
Annual:						
1940-41	5,141	22.5	115,754	3,646	27	3,673
1941-42	5,657	20.6	116,683	3,676	3/	3,676
1942-43	5,729	20.9	119,623	3,768	3/	3,768
1945-46	4,077	19.5	79,529	2,505	258	2,763
1946-47	4,346	20.3	88,380	2,784	160	2,944
1947-48	5,007	21.9	109,782	3,458	265	3,723
1948-49	5,267	22.4	118,219	3,724	-	-

1/ Rough rice of production and where occurring in trade is converted to terms of milled at 70 percent. 2/ Calendar year following harvest. 3/ Not available; probably none was imported.

Compiled from official sources.

The Philippine Government on March 30 announced it was undertaking a 10-year program designed to increase domestic rice production. The main object of the plan is to prevent the recurrence of rice shortages in that country. Not only is the program expected to supply the rice requirements of the Philippines, but it may also provide some supplies for export.

The program is expected to result in the development of approximately 1,200,000 acres of new land, and it will require expenditures of $150,000,000. Construction of 17 irrigation systems at a cost of $12,000,000 has been approved, and $5,000,000 will be made available immediately to undertake the projects. Water supplies from these when completed should irrigate about 120,000 acres of new land.

Plans will be carried out on lands owned by the Government. Three projects which already exist, Ala Valley, Malig, and Mindoro, will be fully developed and new lands in Agusan, Bohol, Panay, Nueva Ecija, Cagayan, Camarines, and the Tablas Plateau in Negros eventually will be brought into cultivation. It is planned that mechanization and modern farming methods will be used extensively. The new rice land is expected to be distributed at a subsequent date among small farmers in accordance with a policy which the Government will adopt.

Rice imports into the Philippines during 1948 of 265 million pounds were the largest since the war and about double the prewar average. Sixty-six percent of receipts came from countries in the Far East, and 40 percent of total imports were from Siam. Quatities from Western Hemisphere countries totaled 73 million pounds, imported from Ecuador and Mexico. Egypt was another source from which the Philippines imported rice.

PHILIPPINES: Rice (milled) imports, by country of origin, average 1936-40, annual 1945-48

Country of origin	Average 1936-40	1945 1/	1946	1947	1948 2/
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
Burma	4	0	0	0	9
French Indochina	79	0	0	0	0
Siam	47	0	61	31	107
United States	0	25	187	110	0
Ecuador	0	0	0	18	51
Mexico	0	0	0	0	22
Chile	0	7	10	0	0
Egypt	0	0	0	0	16
Other countries	1	0	0	0	3/ 60
Total	131	32	258	160	265

1/ November and December. 2/ Preliminary. 3/ 38 million pounds from Indonesia, and 22 million pounds from Hong Kong, all to be repaid in 1949.

Compiled from official sources.

Distribution during 1948 of imported milled rice of the National Corn and Rice Corporation (NARIC) totaled 334 million pounds. At least 70 percent of that is believed to have been sold in Manila. Imported rice stocks of the NARIC on January 1, 1949, were reported at 32 million pounds. These compared with January 1, 1948, stocks on hand of 107 million pounds, which included some purchases of domestic paddy. NARIC distributed 15 million pounds of imported rice during the first quarter of 1949, about one-third as much as during the same period in 1948.

PHILIPPINES: Distribution of imported (NARIC) rice, by months, 1948

Month	Quantity distributed	Month	Quantity distributed	Month	Quantity distributed
	Million pounds		Million pounds		Million pounds
January	14	May	14	September	49
February	16	June	24	October	45
March	13	July	44	November	28
April	15	August	54	December	18
				Total	334

National Rice and Corn Corporation.

The outlook for rice supplies in the Philippines during 1949 is favorable. Including supplies from the large 1948-49 crop, allocations of the International Emergency Food Committee, and rice loans, it appears that the Philippines will receive sufficient rice imports to cover requirements during the months before the new harvest, when shortages often occur.

NARIC arrangements so far have been made for the importation of nearly 200 million pounds of milled rice during the first six months of 1949. Part of the arrivals will be from the regular IEFC allocations to the Philippines. Some rice will be obtained by special arrangements from the surplus available in the United States. Further quantities will be received from loans made by Indonesia and Siam. Imports of approximately 125 million pounds from the United States are expected, and the remainder is to be received from Siam, Egypt, and Burma. For the July-December period of 1949 additional supplies probably will be allocated by IEFC to the Philippines.

The Philippines during 1948, however, negotiated rice loans with Indonesia and Hong Kong totaling 60 million pounds. As of January 1, 1949, approximately 20 million pounds of that quantity had been repaid, leaving a balance of 40 million pounds to be paid from 1949 foreign allocations.

Wholesale prices of Philippine rice during the first quarter of 1949 held relatively steady at a slightly higher level than prices in the same quarter of the year before. Milled No. 1 Macan ranged from $10.77 to $11.34 per 100 pounds compared with $9.11 to $10.93 in the first quarter of 1948. Prices for this grade during April have held slightly higher at between $11.14 and $11.34 per 100 pounds. Mexican imported rice of the NARIC thus far in 1949 has sold at $11.43 per 100 pounds except in one week in January when it rose to $13.21 per 100 pounds. New-crop prices have been steady at $6.70 per 100 pounds, as against $4.54 to $8.06 during the first four months of 1948.

PHILIPPINES: Wholesale prices of milled rice, ex-warehouse, per 100 pounds, April 1949, with comparisons

Year	Macan first-class	Year	Macan first-class	Year	Macan first-class
	Dollars		Dollars		Dollars
Average:					
1914-18	2.67	1937	2.22	1948	
1919	5.47	1938	2.64	January	10.39
1920	5.57	1939	2.60	February	10.05
1921	3.01	1940	2.35	March	10.00
		1941	1/2.51	April	11.66
1922	3.06			May	11.72
1923	3.31	1946		June	12.35
1924	3.85	January	17.69	July	13.08
1925	3.74	February	12.90	August	13.26
1926	3.71	March	12.91	September	2/
		April	16.37	October	2/
1927	3.01	May	18.44	November	2/
1928	3.13	June	18.75	December	2/
1929	3.54	Av. 6 mo.	16.47	Av. 8 mo.	11.56
1930	2.58	1947		1949	
1931	1.91	July	12.96	January	10.97
		August	12.33	February	11.08
1932	1.67	September	10.16	March	11.22
1933	1.91	October	9.36	April	11.24
1934	1.71	November	8.98	-	-
1935	2.22	December	9.64	-	-
1936	2.63	Av. 6 mo.	10.57		

1/ Maximum price established September 1941. 2/ Unquoted.

Compiled from official sources.

Based on reports from Douglas M. Crawford, Agricultural Attache, Manila.

FOREIGN AGRICULTURE CIRCULAR

OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

FR 6-49 May 23, 1949

J. N. EFFERSON REPORTS ON RICE PRODUCTION AND MARKETING IN COLOMBIA AND VENEZUELA

What are the potential foreign markets in the Western Hemisphere for the surplus rice produced in the United States? What competition for these markets may be expected from rice producing countries in Latin America?

Dr. J. N. Efferson, agricultural economist on leave from the University of Louisiana, is seeking answers to the above questions in a four-month survey that he is conducting in several Latin American countries. The study is being made by Dr. Efferson for the Office of Foreign Agricultural Relations, and is a part of the broad marketing research program carried on under the Research and Marketing Act of 1946. The information obtained from this study should prove useful to the United States rice industry in planning its production and marketing programs.

Summaries of his reports on the countries visited by Dr. Efferson since he left Washington, D. C. on March 31 will be published by the Office of Foreign Agricultural Relations throughout the next 3 months. The summaries presented here are of his first two reports, that on the Barranquilla area of Colombia and the one on Venezuela. Dr. Efferson will return to Colombia in July where he will complete his observations on that country at Bogota. He will be back in Washington, D. C. on or about August 1.

Colombia

Colombia offers no prospects as a market for United States rice. This country has increased its production of rice in recent years so that it is now self-sufficient. In some years Colombia may have even a surplus which it will attempt to export to some of its neighboring countries. Since most of the rice is of the Fortuna, or long-grain, variety any exportable surplus may be expected to compete directly with rice produced in the southern States.

Colombian trade and Government representatives now estimate that country will have an export surplus of about 11 million pounds of milled rice in 1949. Producers and millers who are attempting to dispose of this surplus hope to market it in Cuba, Venezuela, and possibly Europe. They want United

States dollars and have announced a price of $9.20 per 100 pounds, f.o.b., Barranquilla, and slightly more for interior-produced rice to cover extra transportation costs to port cities.

Samples of Colombia's export rice indicate that it is the Fortuna variety, a semi-long-grain type, and it is well-milled, has a good color, and contains about 20 percent broken grains.

The 1948-49 (July-June) rice crop of Colombia is forecast by the trade in Barranquilla at 10,780,000 bushels (315 million pounds milled). The rains in 1948 were unusually favorable and ample credit was available to producers of the Bolivar area due to an expected high price for rice. This area therefore raised a larger volume than ever before and that quantity combined with the relatively stable production from the other regions made Colombia a net exporter of rice in 1949.

Three major areas in Colombia produce rice: (1) the coastal zone near the sea, (2) the coastal plains zone in the flat lands along the major rivers leading to the sea, and (3) the interior upland regions.

The coastal zone produces only one crop annually with planting being done in July and August and harvesting in November and December. Production in this area is mostly by primitive methods without the benefits of irrigation and with supplies of moisture being dependent entirely on natural rainfall. The crop is usually sown by hand and harvested and threshed by hand methods.

The coastal plains zone also produces only one crop annually with the crop being sown in April, May, and June, and harvested in August and September. In this area most of the production is by primitive methods with the crop being sown and harvested by hand. This is a region of many small individual producers with most of the crop being upland rice produced without irrigation.

In the interior regions, two crops of rice are produced annually. The first crop is sown in April and May and harvested in July. The second crop is sown in August and September and harvested in December. In this region, production is largely by mechanized methods with the use of tractors, binders, and combines.

There are exceptions, however, to the general outline presented above. There are some mechanized irrigated regions in both the coastal and the coastal plains areas. In addition, there is one region where rice is sown and harvested continuously each month throughout the year as in Java. Finally, there is one small area where the crop is transplanted as in most of Asia.

According to the trade, production in the coastal zone and in the interior regions is fairly stable year after year and can be predicted with

some degree of reliability. Production in the coastal plains zone, however, varies widely from year to year and cannot be estimated until the crop finally moves to market. The variations in the amount harvested in this zone from year to year have the greatest influence on Colombia's total rice production pattern, and determine whether or not in a given year the country is a net importer or a net exporter of rice.

Normally, the coastal zone produces about 20 percent of Colombia's total rice; the coastal plains zone produces about 30 percent; and the interior regions about 50 percent. Production in the coastal plains zone, however, is always either above or below the average. In the Bolivar area this appears to be due to two factors. The first is that most of the crop is upland rice which is dependent on natural rainfall. The second is that the production pattern is one of many small independent producers who depend on outside credit to finance the crop. When the outlook is good, they obtain credit, but when it is not, their production is restricted by lack of credit.

About 75 percent of the total production of Colombia is reported to be the Fortuna variety. The remainder of the harvest is the native "Criollo" type, a long-grain broad type which appears similar to the "Honduras" rice once produced in the United States.

There are two common grades of rice in domestic use in Colombia: (1) high-quality and (2) common. The "high-quality" contains about 10 percent broken grains, has practically no red rice, partially milled grains, or foreign matter, and appears similar to the better-quality Fortuna which is retailed in the United States. This rice is milled for those who can afford it and probably represents about 10 percent of the total domestic consumption. The "common" rice, which is called "intergraded" rice by the trade, contains 25 to 35 percent broken grains, has some red grains and foreign matter, has a yellowish tinge indicative of stack-burn (deterioration in storage), and is undermilled. It appeared comparable with undermilled Fortuna United States No. 5. The "high quality" rice being sold at the official rate of exchange in Barranquilla during the first week of April 1949, was being sold wholesale at $15.60 per 100 pounds and the "intergraded" rice at $9.56 per 100 pounds. Based on a more realistic exchange rate, however, the wholesale prices were about $11.76 per 100 pounds for the "high quality" and $7.21 per 100 pounds for the "intergraded" rice.

Retail prices paid by consumers in Barranquilla were 14 cents a pound for the "high quality" Fortuna and 9 cents a pound for the "common" type. [Retail prices converted at "realistic" exchange rate.]

For the 1948-49 crop year, the Instituto Nacional de Abastecimientos (National Stabilization Board) attempted to fix producer prices for rough rice at $2.92 per bushel, or $10.50 per barrel. The trade reported the organization had found it difficult to maintain this support price, and that

it was then buying rough rice at $2.71 per bushel ($9.75 per barrel) or 21 cents per bushel (75 cents per barrel) less than the support price.

Milling yields for good quality rough rice were reported by the millers to be about 48.5 percent head rice, 15.0 percent first heads, 1.5 percent second heads, or a total of 65 percent edible rice. Poorer quality paddy and paddy stored for several months was reported to have a high broken grain content; the paddy being milled in Barranquilla in April 1949 (after the harvest season for this region of September 1948) was producing less than 40 percent head rice and much of it was stack-burned. An average yield of about 1.5 percent brewers grains, 2.0 percent bran, 2.0 percent polish, and 29.5 percent hulls and waste was also reported. The hulls are used as fuel in most cases.

Venezuela

Venezuela is a very likely market for United States rice. It is expected to remain deficient in rice production for some time. Consequently, serious efforts should be made to develop the Venezuelan market despite the fact the volume of its imports probably will be small. The Venezuelans like United States long-grain rice; they have the dollars to pay for it and will buy if prices are in line competitively.

Venezuelan imports of rice are expected to range from 20 to 45 million pounds annually. Imports during 1948 were stated by Government authorities to be about 30 million pounds. In recent years, most of the imports have come from nearby countries, mostly Ecuador, Dutch Guiana, and Colombia.

Based on an appraisal of crop conditions and current production estimates, Dr. Efferson estimates the 1948 harvest at approximately 900,000 bushels of rough rice (26 million pounds milled). Venezuelan estimates of this crop vary widely - from 226,000 to 3,139,000 bushels. Official statistics considered the most reliable give production in 1944 as 800,000 bushels (23 million pounds milled) and in 1945, when weather was exceptionally good, as 934,000 bushels (27 million pounds).

In contrast to Colombia, most of the rice regions in Venezuela produce only one crop annually. It is planted in April and May, at the beginning of the rainy season, and harvested in July and August, when the rainy season usually slackens for a few weeks. Seeding rates vary from 18 to 36 pounds per acre.

About 80 percent of the rice acreage is sown to upland rice which is planted at the beginning of the rainy season on rolling lands without irrigation and without levees to hold the rainfall. It is produced in the same way United States farmers raise oats and other small grains. The weed problem, which usually prohibits the production of rice by such methods, is solved by burning over the land just before plowing, planting for 2 to 3

years straight, then abandoning the land to let it grow up in jungle again. It amounts to a 20-year rotation, with 3 years in rice and 17 years in trees.

Of this upland rice, about two-thirds is produced under the "machete," or hand type, culture. The land is cleared by machetes, burned, plowed with oxen teams, seeded by hand, cut with machetes, and threshed by hand. In some of these regions, such as the Orinoco Delta where rainfall is very heavy, the crop is harvested as it is in Java by cutting off the grain heads only, tieing them in bundles, and hanging them up on the walls and in the house out of the weather to dry sufficiently to thresh.

The remaining one-third of the upland rice and most of the 20 percent of the crop which is irrigated is produced under mechanized conditions. For this production, tractors are used for plowing in most instances, and harvesting is done with binders, the small 6-foot tractor-propelled combines, and in few cases the larger self-propelled combines. All of this machinery has been imported from the United States. Most of the irrigated rice is watered by means of gravity-flow systems in which small mountain streams are dammed to create a reservoir, and a series of ditches and flood-gates control the flow. There is also a small amount of diesel pumping from surface streams and are several small public-power irrigation systems.

Although combines are used, there are no rice dryers in the farming areas. After harvesting, the crop is usually spread out in a thin layer on the concrete floors of large drying sheds, and turned frequently. When drying is completed on the mechanized farms, the rough rice is sacked and stored in warehouses on the farms or in Government warehouses. The smaller supplies of the many more primitive-type producers are usually stored in the farm home until used or sold to a local buyer. Some rice is hand-pounded on farms for home use but most of it is taken to nearby mills and toll-milled or sold.

One large farm was visited which was carrying on an interesting type of production program on a large mechanized scale. A similar program had been seen by Dr. Efferson only once before, in Java, and there it was conducted on a small, hand-labor scale. The Venezuelan producer on this farm had planted about 450 acres to rice and was irrigating by means of a private gravity-flow system based on a reservoir in a nearby mountain range. In the second week of April, when Dr. Efferson visited him, he had rice in all stages of growth. His practice is to start planting about the first of November and plant about 75 acres a month for the 6-month period ending in April. Thus he was plowing land for rice, seeding rice, irrigating rice for the first time, irrigating and weeding more mature fields, draining others where the crop was almost mature, and harvesting with self-propelled combines on still other fields. From this point, he carried the process one step further. After cutting the crop, he reflooded the fields and was producing a second or stubble crop from all the land on an organized commercial basis. Thus by obtaining two crops a year from one planting, his harvesting season starts in February and continues through November. He reported average yields of 26.8

bushels of rough rice per acre on the first cutting and 8.9 bushels per acre for the stubble crop. His most serious problem, in common with rice farmers throughout Venezuela, is the control of the rice birds which feed in the rice fields from April to October. He reported average costs of $24 per acre for labor to patrol the fields to keep out the birds and still maintains losses from the birds.

The preferred variety of rice in Venezuela is Fortuna, which makes up 80 percent of the total production. A native longer-grain type, similar to that produced in Colombia, is also produced there. Experiment Station results over a 6-year period show that the Zenith variety, an even more recent United States production, yields about 50 percent more per acre in Venezuela under the upland dry-land rice farming conditions than do the other varieties.

Based on these results, fairly large experimental plantings of Zenith were made in 1948 in the State of Portuguesa in Western Venezuela. This region has large areas of gently rolling land which can easily be put into dryland rice. The results of these tests under farm conditions in 1948 were unusually good. For that reason, 330,000 pounds of Zenith seed had been imported from the United States and an additional 150,000 pounds purchased from local farmers to be used in a Government-sponsored rice expansion program in this area in 1949.

This seed was distributed and was being planted in April in blocks of from 100 to 500 acres per farm. This project is expected to provide an additional 11,000 acres of rice, and, based on last year's experimental yields, produce 430,000 bushels of rogh rice above the usual production in the established areas. In 1950, provided the experiment is a success in 1949, it is planned to continue the program to expand the production of Zenith rice in dryland farming areas to produce an additional 750,000 bushels over production in 1948. Although this goal may not be realized, the project should result in some increase in Venezuela's rice production in the next 2 years.

According to a recent census of industries, there are 129 rice mills in Venezuela. Most of these are the relatively small local-type operators; 17 are classified as having a milling capacity of less than 55 pounds of milled rice per hour; 24 are rated at from 55 to 219 pounds per hour; 65 are rated at 220 to 659 pounds per hour; and only 23 are listed at more than 660 pounds per hour. Of these mills, 39 are owned and operated by the Government and 90 are in private hands.

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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Trinidad and Other British West Indies and British Guiana 1/

Trinidad and the other British West Indies will have to import from 70 to over 100 million pounds of rice for some years to come. United States producers or millers may be able to market some of the rice required by the Islands. There is a shortage of dollar exchange in that area, however, and production of sugar is given far more emphasis than rice. The demand on the Islands is mostly for "white parboiled" rice which would indicate a possible outlet for some of the lower quality parboiled types produced in the United States.

British Guiana, producing an exportable surplus, contracted to supply most of the rice import needs of Trinidad and other British West Indies in the 5-year period 1947-51. The Colony has fallen short of its commitments thus far and in 1948 additional rice for Trinidad was imported from Brazil at considerably higher prices. The 9 islands covered by the contract do not include a large importer of rice, Jamaica, which is also the principal British West Indies market for United States rice.

Trinidad and the other British West Indies

Trinidad and the other British West Indies will continue to be deficit in rice and will require annual imports of about 40 million pounds for Trinidad alone and from 30 to 70 million pounds for the other islands for some years to come. The parboiled rice they prefer is almost white in color rather than the usual yellow type preferred in most of India. This "white parboiled" rice is produced in the few commercial mills by subjecting the rough rice to steam, usually no more than 10 to 15 minutes, which is a shorter period of time than is common in India and Burma.

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

The minimum annual import requirements of rice were established for islands of the British West Indies at an overall meeting of food supply workers held late in 1946. The milled rice requirements of these islands in excess of domestic production totaled 65 million pounds. They were as follows: Antigua, 2,930,000 pounds; Montserrat, 269,000 pounds; St. Kitts, 2,150,000 pounds; Dominica, 582,000 pounds; Grenada, 2,408,000 pounds; St. Lucia, 896,000 pounds; St. Vincent, 1,792,000 pounds; Barbados, 20,608,000 pounds; and Trinidad, 33,600,000 pounds. [Those do not include the rice requirements of all the British West Indies. Jamaica's prewar import requirements alone were approximately 40 million pounds.]

At the same meeting the British Guiana Rice Marketing Board, the English-controlled Governmental agency in the colony which is the sole exporter of rice, contracted to supply these islands with 80 percent of the stated minimum requirements annually for a 5-year period beginning in 1947 and ending in 1951. At the end of the 5-year period the contract may be renewed for an additional 3 years. It was indicated that the overall annual consumption of rice in the British West Indies [probably at the prewar rate of consumption] could be approximately 160 million pounds of milled rice.

The unusual thing about this contract is that the British Guiana Rice Marketing Board agreed to a fixed price, to be the same throughout the 5-year period, equivalent to about 4 U.S. cents per pound for milled rice, f.o.b., Georgetown. The low price paid for British Guiana rice made it possible for the Trinidad Government to hold the fixed retail price of rice at 4.7 cents per pound until Brazilian supplies at a higher cost were obtained. Brazilian rice delivered in Trinidad cost about 10 cents per pound in 1948. The average cost of all rice imported in 1948, including both sources, was 6.6 cents per pound.

Wholesale and retail rice prices in Trinidad continue to be controlled at relatively low levels by Government subsidy despite the higher costs for Brazilian imports. In April 1949, the retail price for imported rice sold in urban districts was fixed at 4.6 cents for three-fourths of a pound, and in the rural areas at 4.2 cents for three-fourths of a pound. This is rationed at three-fourths of a pound per person per week. Rice is the only commodity still rationed in Trinidad, and in view of the present supply situation rationing of this product is expected to be continued for several years. The fixed price for rough rice produced in Trinidad is $1.33 per bushel and the local fixed price for clean rice produced from this rough rice is 5.9 cents per pound at retail.

British Guiana has not been able to supply Trinidad or the other British West Indies with all of the rice guaranteed in the 1947-51 contract. Trinidad, expecting about 35 million pounds annually from British Guiana, received 26 million pounds in 1946; 21 million in 1947; and 18 million pounds in 1948. In addition to imports from British Guiana in 1948, Trinidad imported 9 million pounds from Brazil. Thus

Trinidad's rice imports in 1948 were about 27 million pounds as compared with the prewar average of around 40 million pounds annually and the wartime average of nearly 35 million pounds.

Including domestic production and imports, total supplies of milled rice for Trinidad in 1948 amounted to about 65 million pounds. At the present time, about one-half of the quantities consumed is imported, and there is much interest in the island as to methods of increasing production. The crop at the present time is produced on small farms in units of from 2 to 5 acres on an unorganized basis and is mostly for home use.

The 1948 rice production in Trinidad amounted to 38 million pounds of clean rice produced from 23,500 acres. About 20,000 acres of this total was irrigated swamp land, on which rice is produced in small plots by East Indian peasant farmers and sugar plantation workers, under conditions similar to those where rice is grown in India. It customarily is plowed and puddled under water, transplanted, cut by hand, and threshed by hand or with bullocks. Then it is parboiled (boiled in open pots) on the farm in amounts equivalent to about 1 week's needs of a farm family, and is either hand-pounded on the farm or taken to a small local mill for milling on a fixed-fee basis. The remaining 3,500 acres was upland rice, or the so-called "hill" rice of Trinidad. This crop is grown by Negro hill farmers under primitive conditions. A hillside is usually cut and burned. The rice seeds are "dibbled" into the freshly-burned-over land by digging holes with a hoe, or a stick, dropping several seeds in each hole, and covering with the foot. The land is not plowed or harrowed. No weeding is practiced and the crop is cut and threshed by hand and parboiled before hand-pounding or milling. Thus the rice crop in both cases is planted in April to June and harvested in December. Practically no irrigation is practiced as a 65-inch rainfall during the 5- to 6-month growing season is usually sufficient.

British Guiana

British Guiana's goal for annual rice production is 7,700,000 bushels of rough rice (225 million pounds milled) and for exports, 150 million pounds. Although there is little indication that the Colony is likely to reach this goal within 5 years, there is some indication that steady progress will take place in increasing production. British Guiana is under pressure to expand output to meet its commitments under the 1947-51 contract between the Colony and the British West Indies.

The production of British Guiana in 1948-49 (October-September) is estimated at 4,976,000 bushels of rough rice (146 million pounds milled). The preliminary estimate for the fall-harvested crop is 4,357,000 bushels (128 million pounds) from an area of 75,000 acres. In the spring-harvested crop, about 619,000 bushels (18 million pounds) was produced from 10,000 acres planted and 20,000 acres harvested.

Of the two crops produced annually in British Guiana, the first and most important is planted in April and May and harvested in September and October. The second is planted in November and December and harvested in March and April. The difference between the planted and harvested acreage of the spring-harvested crop is due to the fact that about one-half of it is produced from "drop seed" from the previous crop. When the land is freshly plowed the seed grows, and further seeding is not necessary. This crop is sometimes 50 percent red rice, but it is a cheap crop.

About one-half of each of the two crops is seeded in nurseries. When the land is plowed and puddled with bullocks, the rice is transplanted by hand and is hand-weeded to some extent. This is on the small so-called peasant farms. The remaining 50 percent is plowed with bullocks or with tractors, usually under water, and harrowed. Then the seed is broadcast, mostly by hand, on wet or flooded land. Although there is some artificial irrigation, usually in connection with sugar production, most of the rice is irrigated by the accumulation of a heavy natural rainfall within the levees which are plowed up around the growing fields.

Most of each crop is harvested by hand, shocked in the field for a few days, and then threshed by the tramping of bullock teams, usually under an open palm-thatched shed, and dried in the sun.

There are about 200 rice mills in British Guiana, usually small, which purchase rough rice, or mill it on a toll basis. All of these mills have vats or drums used for parboiling and open-air concrete drying floors. Rough rice is delivered by producers in 140-pound bags and is milled and sacked in 180-pound units. All the production is of our medium-grain type produced in a 165-day growing season. Most of the rice is mixed. While some of the grains appear to be Blue Rose, others are more similar to Fortuna. All varieties are selected locally. Due to the conditions under which it is produced, all rough rice is highly infested with red grains. The average red-rice content for rough rice is 12 percent and some lots where the crop has been produced from "drop seed" contain 50 percent. Only two Government mills produce reasonably good-quality milled rice, and most of that is discolored, has a high percentage of broken grains, and more than a trace of red rice.

Serious thought was given to expanding rice production in British Guiana in 1941-42 when shipping difficulties caused shortages in the British West Indies. The Colony exported only 19 million pounds of milled rice in the crop year 1940-41. The major agricultural product was sugar and rice production was considered a by-product of a large number of peasant farmers and sugar laborers. When rice shortages increased in 1942, however, the Department of Agriculture began to consider seriously a rice expansion program and concluded that the best way to increase production, in view of the limited manpower resources and relatively large amount of available land, was to introduce mechanized rice production in the Colony. The first large mechanized-rice-farm plan, now known as the Mahaicony-Abary Development Scheme, was begun in 1943.

Dr. Efferson made a comprehensive 2-day tour of the Government-sponsored Mahaicony-Abary Rice Development Scheme and a 1-day tour of the Bergenorgen Rice Farmer Settlement Scheme to observe production, milling, and marketing practices.

The Government took over a large area of "crown land" on the coast located between the Mahaicony and Abary Rivers, about 30 miles from Georgetown. It brought in tractors and combines, and began growing rice. On this project, the acreage harvested increased gradually from 700 in 1943 to 4,000 acres in 1947. The harvested area decreased to 3,000 acres only in 1948, when weather was unfavorable for production. The acreage planted for harvest in 1949 is 4,500 acres.

The rice land in the Mahaicony-Abary project is treeless, very flat, and is below sea level at least 4 feet during the high spring tides, but it is protected by a concrete dyke which runs along the coast most of the length of British Guiana. Automatic flood-gates are used to drain the land into the sea at low-tide, and a central pumping station on a river at the back of the property releases the water into the irrigation ditches. The soil is a heavy-greyish, very-hard clay with a top layer of black, loose, peaty deposit, organic in character and very fertile. This top layer, called "pergasse", averages about 4 inches in depth. According to many observers, about 1 million acres of such land in the Colony, ranging from 1 to 16 miles in width along the coast, could be developed for rice.

The Mahaicony-Abary project was supposed to demonstrate the practical possibilities of mechanized rice production in British Guiana and thereby encourage local producers to expand production. This project now has 75 tractors, including 55 steel-wheel Model "LA" Case tractors and 20 rubber-tired Model "55" Massey-Harris tractors. It owns 30, 3- and 4-bottom moldboard plows, 30 disc plows, 40 disc harrows, 20 grain drills, 52 Case tractor-pulled 6-foot combines, 12 Massey-Harris self-propelled combines on steel tracks, with cutter-bars of from 8½ to 12 feet, 6 trucks, and 2 jeeps. Of the 75 tractors, 60 are used on the project and 15 are rented out on an operating cost basis to nearby farmers as a means of teaching them the advantages of tractors.

The project is organized into three major divisions, the agricultural operations unit, the milling unit, and the machinery maintenance unit. As the volume of production increased, it became necessary to construct a rice mill on the property. A mill was built by a construction company of Houston, Texas, in 1947-48 and it mills less than 11,000 pounds of milled rice per hour. About 50 native laborers are maintained for the operation of the mill and a peak load of 200 laborers for field work is maintained during the planting and harvesting seasons.

The Mahaicony-Abary project probably will be moderately successful on a Government-subsidized basis and will be continued but there will probably

be few other similar projects established. Although the layout of the land and the soil is perfect, weather conditions make machinery operation expensive at best and declining yields are likely to occur after several years of continuous production on the thin top layer of humus soil.

The two chief bottlenecks appear to be drying and milling, as there are no dryers and harvesting conditions frequently are very wet. The practice in drying combined rice is to spread it out on a thin layer on open-air concrete floors. This is satisfactory on the small farms where there is sufficient labor and small enough volume of production to enable it to be quickly sacked and moved to shelter when it rains, but it is difficult in large mechanized operations. More important, the rice must be parboiled and redried immediately before milling. Less than 2 percent of the total production in 1948 was milled as raw white rice and more than 98 percent was parboiled. This is because most of the rice-consuming population of British Guiana and of the British West Indies is of East Indian origin, and they demand parboiled rice. Thus, because of the weather conditions which make drying very expensive, the rice is parboiled at a higher cost than that involved in producing raw rice, even with a somewhat higher milling yield. In most of the mills, the rough rice is soaked overnight in barrels, which usually are discarded oil drums, and then a steam pipe is pushed into the drum and the rough rice steamed for from 10 to 15 minutes.

The other major project, the Bergenorgen, is a "communal farm" type. It provides communal pasture land and rice plots of from 3 to 15 acres to each of 200 families. The rice is produced according to primitive methods, and is milled on a toll basis in a central mill on the farm and sold to the Rice Marketing Board by the farm manager. In view of the relatively high price of labor in this area, in comparison to areas in Asia where hand-labor methods of production are economical, this type of project is unlikely to result in an increase in the volume of rice for the export trade.

All rice milled in British Guiana must be delivered to the Rice Marketing Board at fixed prices established by the Board. The 1948-49 prices for Grade "A" rough rice were 84 cents per bushel; for Grade "B", 79 cents per bushel; and for Grade "C", 73 cents per bushel. The grades are determined by weight per unit of volume and percentage of red rice, with 12 percent being the standard for Grade "B" rough rice.

Rice marketing is under the control of the Rice Marketing Board. Milled rice is graded in 8 different grades of milled parboiled and 3 grades of milled raw rice. The top grade of parboiled, "Super," has a tolerance of not more than 12 percent brokens and discolored grains. The most common grade produced, "No. 1," has a tolerance of not more than 25 percent brokens and discolored grains.

Fixed prices for milled rice vary from $3.94 per 100 pounds for "Super" parboiled to $3.51 per 100 pounds for "No. 1" parboiled, and $1.97 per 100 pounds for "unclassified." The Board allocates all supplies for domestic consumption at prices similar to those paid for the rice. It then sells the surplus to the British West Indies export markets. The f.o.b. export prices are slightly higher than prices paid for the rice, which gives the Board an operating margin and a good profit in some years.

Export prices charges by the Board, the prices fixed for the entire 1947-51 period under their contract with the British West Indies, are $4.87 per 100 pounds for "Super" and $4.22 per 100 pounds for "No. 1." Producers requiring milled rice for home use are required to deliver two 140-pound bags of rough rice for each 180-pound bag of milled rice obtained, are charged a milling fee of 61 cents per 100 pounds of milled rice received, and are limited to 1 bag of milled rice per family per month.

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SIAM INCREASES RICE PRODUCTION; EXPORTS GAIN SHARPLY

Siam before World War II ranked third in world rice exports. Political disturbances in Burma and French Indochina this year have caused a reduction in the trade of those countries, so that Siam is now the country having the largest exportable surplus of rice.

Production of rough rice in Siam in 1948-49 is estimated by the Office of Foreign Agricultural Relations at approximately 250 million pounds, a moderate increase over output in the year before. The weather during the season was exceptionally favorable for production, and yields per acre were high.

Seeding of the 1949-50 crop is now in progress (May-June) and the rice will be transplanted in August. The receipt of satisfactory prices for rough rice from last year's harvest together with continuation of peacetime conditions in the country indicate a large area will be planted to rice. Provided the weather is favorable again for growing and harvesting, Siam is expected to produce another large crop.

SIAM: Rice acreage, production, and exports, 1948-49 with comparisons

Year	Acreage harvested	Yield per acre	Production: Rough	Production: Milled equivalent	Exports	Production minus exports
	1,000 acres	Bushels	1,000 bushels	Million pounds	Million pounds	Million pounds
Average:						
1920-21/24-25	5,891	36.9	217,432	6,360	2,483	3,877
1925-26/29-30	6,205	34.3	213,016	6,231	2,629	3,602
1930-31/34-35	7,141	32.4	231,402	6,769	3,298	3,471
1935-36/39-40	7,087	30.1	213,079	6,233	2,920	3,313
1946-47 1/	5,500	30.9	170,000	4,972	847	4,125
1947-48 1/	6,700	34.3	230,000	6,700	1,790	4,910
1948-49 1/	7,100	35.2	250,000	7,300	2,750 2/	4,550

1/ Acreage, yield per acre, and production are estimates of the Office of Foreign Agricultural Relations.
2/ Exportable surplus.

Compiled from official statistics, except as noted.

Rice exports from Siam in 1949 from the 1948-49 harvest (mainly December) are expected to be sharply above those in 1948. Shipments during the January-May period approximated 1,430 million pounds, or nearly double the 760 million exported during the corresponding months of the year before.

SIAM: Rice exports, May 1949, with comparisons

Months	Year			
	1939	1947	1948	1949
	Million pounds	Million pounds	Million pounds	Million pounds
January	293	95	121	226
February	325	43	141	328
March	381	73	162	345
April	363	126	178	308
May	401	104	159	224
Jan.-May	1,763	441	761	1,431
Jan.-Dec.	3,802	871	1,790	-

Compiled from preliminary data, American Embassy, Bangkok.

Rice during the January-May 1949 period was exported chiefly to Asia. The principal countries of destination were India, Malaya, China, Indonesia, and Ceylon, which together imported more than 80 percent of the total shipped. Exports to Europe comprised 17 percent of the deliveries, and were primarily to the United Kingdom, Netherlands, Sweden and Ireland.

SIAM: Rice (milled) exports by country of destination, January - May, 1949

Continent and Country	January-May 1949	Continent and Country	January-May 1949	Continent and Country	January-May 1949
	Million pounds		Million pounds		Million pounds
ASIA:		ASIA-cont.		EUROPE-cont.	
Ceylon	84	Hongkong	54	Norway	4
China	173	Japan	69	Sweden	6
India	463	Malaya	250	Switzerland	3
Indonesia	163	Total	1,340	United Kingdom	35
Philippines	37	EUROPE:		Total	86
Portuguese India	5	Czechoslovakia	2	Damaged or Lost	5
Borneo	15	Ireland	5	Total exports	1,431
Sarawak	27	Netherlands	31		

Source: American Embassy, Bangkok.

Purchases of the 1948-49 crop from December 1 through May totaled 2,020 million pounds, an amount larger than all of the 1949 exports of around 1,800 million pounds. Increased purchases and continued heavy shipments so far this year indicate 2,750 million pounds may be exported in 1949. This was the volume estimated as the exportable surplus on December 1, 1948. Total exports would be approximately 90 percent of the prewar (1931-40) average trade of 7,100 million pounds. Siam's 1947 and 1948 rice shipments were 28 and 58 percent, respectively, of the prewar average exports.

SIAM: Exports of milled rice, by country of destination, January-March 1949, with comparisons

Country of destination	Average 1936-40	1946	1947 1/	1948 1/	January-March 1/ 1948	January-March 1/ 1949
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
Borneo	7	24	57	23	11	12
Ceylon	111	0	0	23	0	55
China	71	238	278	484	112	77
Hong Kong	630	159	85	132	80	44
India	77	58	69	365	66	312
Indonesia	26	149	96	173	0	119
Japan	193	0	0	0	0	0
Malayan Union	1,118	216	169	342	108	185
Manchuria	24	0	0	0	0	0
Philippines	52	0	39	132	0	0
Belgium	64	0	0	0	0	0
Germany	62	0	0	0	0	0
Netherlands	82	0	0	14	0	20
United Kingdom	75	0	0	10	2	35
Africa	86	0	0	0	0	0
Cuba	176	0	0	0	0	0
Korea	0	0	0	43	0	0
Others	66	147	54	49	45	42
Total	2,920	991	847	1,790	424	901

1/ Preliminary.

Compiled from official sources.

Export prices of milled rice are set by the Government, and have remained unchanged throughout 1948 and the first quarter of 1949. Separate prices are fixed for a number of grades based on the percentage of broken grains. The distribution of grades is such that the average price is $7.20 per 100 pounds, including export duty, but excluding gunny sacks.

SIAM: Rice prices, white No. 1, 25 percent broken, per 100 pounds, ex-mill, 1919-20/39-40

Year (April-March)	White No. 1	Year (April-March)	White No. 1	Year (April-March)	White No. 1
	Dollars		Dollars		Dollars
1919-20	6.10	1926-27	3.17	1934-35	1.06
		1927-28	2.86		
1920-21	2.56	1928-29	2.68	1935-36	1.36
1921-22	2.54	1929-30	2.69	1936-37	1.52
1922-23	2.48			1937-38	1.43
1923-24	2.60	1930-31	2.22	1938-39	1.31
1924-25	2.92	1931-32	1.32	1939-40	1.11
		1932-33	0.98		
1925-26	3.07	1933-34	.79	-	-

Siam Statistical Yearbook, 1935/36 - 1936/37.

Market quotations on milled rice at the end of the first quarter ranged from $5.45 to $6.07 per 100 pounds. These are for rice ex-mill, excluding export duty and gunnies but including purchase tax.

SIAM: Rice prices, ex-mill 1/, per 100 pounds, March 1949

Grade	Percent brokens	Price	Grade	Percent brokens	Price
	Percent	Dollars		Percent	Dollars
Sublime	5	6.07	No. 1	25	5.13
Extra super	10	5.84	A-1 super	-	4.48
Super	15	5.60	C- super	-	3.45
Special	20	5.36			

1/ Excluding export duty and gunny sacks, but including purchase tax.

Source: American Embassy, Bangkok.

Outlook

There is no let-up in the drive to export rice. The country's economic policy is to maintain an export balance of trade. Rice contributes heavily to that balance especially at present prices. Given normal growing conditions, Siam may be expected to continue its postwar upward trend in production and exports.

Based in part on reports from John F. O'Donnell, Jr., American Embassy, Bangkok, Siam. The production statistics published in this report were not reported by the American Embassy, but consist of estimates made by the Office of Foreign Agricultural Relations.

FOREIGN AGRICULTURE CIRCULAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Brazil 1/

Brazil is not likely to be so important in the world trade of rice in the next 5 years as it has been in the years 1945 through 1948. Exports are expected to average not more than 200 million pounds annually. The Rio Grande do Sul area will continue to produce short-grain rice which will compete to some extent with United States rice in export markets.

Rice exports from Brazil in 1949 will be down sharply from war and postwar years. Probable deliveries abroad will be closer to 120 million pounds than the 200 million forecast earlier in the season. In comparison, about 200 million pounds were exported in 1945; 335 million in 1946; 546 million in 1947, and 456 million pounds in 1948. In the first 6 months of this year, the trade is not likely to exceed 7 million pounds. Only 1,953,000 pounds were exported in the first 3 months of the year.

Reasons for the change in the export-supply picture of rice in Brazil this year are as follows: (1) Serious shortages of rice which occurred in some regions of Brazil near the end of the 1948-49 marketing season have resulted in the prohibition by the Brazilian Government of exports until the country's requirements have been determined, the domestic production evaluated, and supplies reserved to meet domestic needs before export permits are issued. Since the major part of the crop is harvested in April and May and it is June or July before the supplies available within the country are fully known, the Government is not likely to issue major export permits until late July or August. (2) A prolonged dry spell in central and southern Brazil lasting from mid-November to March, the peak of the growing season, caused an estimated decrease in production of about 4.9 million bushels. Total production of rice in Brazil is now estimated to be about 110 million bushels of rough rice or the equivalent of about 3,200 million pounds of the milled product.

The forecast that exports probably will not exceed an average of 200 million pounds annually for the next five years is based on several

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

factors. The population of Brazil is increasing rapidly. It gained from 30.6 million in 1920 to 41.2 million in 1940 and is continuing to increase at the rate of about 1.6 percent per year. The population in 1949, therefore, probably numbers about 47 million people. Rice is one of the basic foods and due to decreased purchases of wheat, the per-capita consumption rate of rice has been increasing. With the exception of production in the Rio Grande do Sul region in southern Brazil, rice output in Brazil has been gaining only fast enough to meet domestic demands. Indications are that the expansion of production may beless than the increase in consumption, thus a larger part of the export surplus from Rio Grande do Sul may be needed in central and northern Brazil. This would result in smaller supplies for export.

An important factor to remember when considering the future production of rice in Brazil is that this crop was expanded during the war as the result of unusually high world prices for rice. Cultivation is not likely to increase further in central and northern Brazil, because costs of production on the farms which are predominantly small, are not easily reduced in trying to meet the drop in world rice prices. The Rio Grande do Sul region, however, is an area of large farms located on good land. Some long-time increase in production is possible in this area, although declining prices plus physical limitations of land and water are likely to retard any large-scale expansion. The indications are that any increase in available supplies from Rio Grande do Sul may be absorbed by the increasing demands from other areas in Brazil.

Background

Brazil is the fourth largest country in the world. If the United States had another State the size of Texas, it would then be about as large as Brazil. The country, the "Estados Unidos do Brazil", consists of 20 different states, the Federal Territory of Acre, and the Federal District. Rice, one of the major food crops of the country, is produced in every major area of the nation. It appears more widely grown in Brazil than corn is in the United States, with as many different types, and several methods of production and marketing.

For purposes of classification according to areas of rice production, the country may be divided into three major rice regions: (1) Northern Brazil, with the major States being Para, Maranhao, and Piaui; (2) Central Brazil, including the more important States of Sao Paulo, Parana, Goiaz, and Minas Geraes; and (3) Southern Brazil, which consists primarily of the State of Rio Grande do Sul.

The total acreage planted to rice in Brazil in 1948, about 4 million acres, represents an area more than twice that cultivated in the United States. Brazil's acreage was almost twice as large as the prewar average. The average in the 1931-35 period was 2.1 million acres and 2.3 million in the years 1936-40. Total production has increased at about the same rate. The average per acre yield, from 28 to 29 bushels, or 8 barrels per acre, has been relatively stable since 1930. The most recent forecast as to 1948-49 production is 4,080,000 acres and 110,000,000 bushels of

rough rice. The per acre yield this year is indicated to be below average.

According to observations of Dr. Efferson and reports from different parts of the country with respect to production methods, only about 10 percent of the acreage devoted to rice in northern and central Brazil is the irrigated type similar to that in the United States. Dryland rice is grown on approximately 90 percent of the acreage in these regions. It is produced on rolling to hilly lands without irrigation and is dependent entirely on rainfall for water supplies during the growing season. In Rio Grande do Sul, on the other hand, only 10 percent of the total area is dryland rice, while 90 percent is irrigated. In 1948-49 the area planted to dryland rice amounted to 79 percent, and to irrigated rice, 21 percent. This proportion reportedly has not changed significantly in the past 20 years. The high percentage of production of dryland rice in Brazil dependent on rainfall is a reason for wide variations within the areas of production from year to year.

Statistics by regions indicate that about 12 percent of the total rice area is in northern Brazil, 75 percent in central Brazil, and 13 percent in southern Brazil. According to production statistics, however, only 10 percent of the volume is produced in northern Brazil, 65 percent in central Brazil, and 25 percent in southern Brazil. The average yields harvested per acre in the large dryland rice regions of northern and central Brazil are only about one-half the average yields per acre produced in the irrigated regions of Rio Grande do Sul. Thus the southern region produces one-fourth of the total production on only about one-eighth of the total area.

Most of Brazil's population is located in the central area, in or near the large cities of Rio de Janeiro and Sao Paulo and in the nearby large areas of coffee and cotton farming. The northern region is usually about self-sufficient in rice production, with a small surplus in years of good weather; the central region, although it produces most of the rice, is usually deficient in rice and requires imports; and the southern region, Rio Grande do Sul, is the only rice area having an important surplus.

Practically all of the dryland rice produced in Brazil is the Agulha type, or "needle rice", while most of the irrigated is the short-grain Japanese rice. A small amount of medium-grain rice is produced under both dryland and irrigated methods. The Agulha, or "needle rice", is a long-grain type similar to the Fortuna variety in the United States and in some cases to the Honduras formerly produced in southern United States. It is not so long, nor does it have so high a quality, as the United States Rexora or Patna varieties, but has a longer grain than any of the United States medium-grain types. The Blue Rose is the principal medium-grain rice produced in Brazil. It was introduced in 1929 and although mixed somewhat since that time with other medium-grain, including Early Prolific, medium-grain rice in Brazil is commonly called Blue Rose. The Brazil short-grain rice is called Japonez and dates back to the introduction of Japanese varieties into southern Brazil in 1918.

Since that time, other short-grain varieties including Gigante from Italy, Estirpe 43 from Egypt, and Caloro and Colusa from the United States have largely replaced the original Japanese types. All short-grain rice, however, is still termed Japonez.

At the present time about 70 percent of the rice produced in Brazil is the Agulha long-grain type, about 5 percent is the Blue Rose medium-grain, and 25 percent is the Japan short-grain rice. In northern and central Brazil, about 95 percent of the total production is the Agulha, about 3 percent the Blue Rose, and 2 percent the Japanese type. In Rio Grande do Sul, however, about 85 percent of the production is the Japanese type, about 10 percent is the Blue Rose, and only 5 percent is the Agulha long-grain rice. Before the war, in the 1935-39 period, the Rio Grande do Sul area produced about 60 percent short-grain, 35 percent medium-grain, and 5 percent long-grain rice. Apparently due to high prices and reduction of quality differentials during the war, many farmers in the exporting State of Rio Grande do Sul shifted to the production of short-grain rice. This type is better adapted to the short growing season, and yields more per acre.

Most of the consumer demand in Brazil is for long-grain rice, and the second preference is medium-grain. Brazil, therefore, has not exported large quantities of long-grain rice, even though this type equals about three-fourths of the total production. The country probably will not export significant quantities of long-grain or medium-grain rice in the near future.

The dryland rice regions of central and north Brazil

The dryland rice harvest in central and northern Brazil comprises more than 70 percent of the total production of the country. It is produced mostly on rolling to hilly land, and is grown under relatively primitive conditions. Irrigation is not practiced, and hand methods are used. Rice is a major food crop on many small farms, and it is a supplementary food crop for laborers on large farms.

Most of the dryland rice in Brazil is produced with the use of only one piece of farm equipment, the hand hoe. The production pattern is as follows: (1) The trees and brush from virgin land are cut, piled, and burned during the latter part of the dry season. This in most areas is from May to August. (2) When the first general rains begin in September and October, the freshly burned-over land is hoed, shallow holes in the soft earth are dug, rice seeds at a uniform rate of 7 per hill about 10 inches apart are dropped, and the hill is covered with the feet. (3) The growing rice is hoed 2 to 3 times and all weeds are chopped out during the growing season, which is from November to March. (4) The crop is cut by hand in the harvest season from February through March. The harvested rice is then tied in small bundles and hung on small racks to dry. (5) These small bundles of cut grain after 1 to 3 weeks are transported to a central location, usually not more than 200 yards distant, by hand or with oxen and carts. Then the crop is threshed. To thresh, the bundles are beaten over a slatted-rack platform which is encircled with a 4- to

5-foot canvas wall to prevent the threshed grain from scattering. When the bundles are thrown against the limb slats, the rice grains fall through, are raked up, and are winnowed by the wind. The usual crew for a harvesting operation of this type includes 2 workers to cut, 1 to haul (with an ox-cart), and 2 to thresh. The rough rice is produced under these conditions on many small farms, and is usually stored at the farm. In many cases, especially in the Amazon region in the North, this rough rice is stored in the rafters where the heat and smoke from the fire keep it dry. Since the crop deteriorates less as rough rice than as milled, the practice is to take small quantities to small mills nearby where it is milled on a toll basis as needed for home use. Small surpluses are sold to local buyers who, in turn, accumulate larger volumes and sell to mills, or to larger concerns. The farm family usually produces no more than 10 acres of rice annually.

The volume of Brazil's future rice exports appears to depend to some extent on the permanency of dryland rice production. If this production should continue to expand, rice would not be required from Rio Grande do Sul and Brazil's export supplies will increase. If dryland rice production, on the other hand, does not continue to advance in proportion to the gain in population in central Brazil, that area will require larger imports from Rio Grande do Sul's commercial crop, and export supplies for foreign countries will decline. According to most authorities in Brazil and in the American Embassy, the expansion of dryland rice production in recent years has been the result of relatively high prices. Rice has been a more profitable crop than cotton and has replaced cotton as a cash crop on many farms. Additional lands are being cleared for cotton and coffee, on which dryland rice is usually the first crop planted. The supply of good land for cotton and coffee planting, however, reportedly is being exhausted, and the world price of rice is declining. Upland rice production in Brazil, therefore, is not expected to expand in the next 5 years to the levels of the last 5-year period.

Commercial rice region of Rio Grande do Sul

In contrast to most of the remainder of Brazil, rice production in the State of Rio Grande do Sul is semi-mechanized and most of the rice is irrigated. It is cultivated on fairly large level lands and reasonably efficient production and marketing methods are followed. Long-time rotations tend to stabilize yields per acre and total production from year to year. The area looks like much of the rice farming land in southern United States.

The farming, however, is not mechanized as we, in the United States, think of mechanization. The land plowed with tractors is less than 10 percent of the total area planted. Most of the land is plowed in fall and winter (May to July) with oxen teams drawing 8 to 12-inch steel mouldboard plows. While some fields are plowed with tractors, most of the farmers report they prefer to use the more expensive equipment only when a rush job is to be done, such as fitting and harvesting. Tractors are more widely used for fitting operations in the spring months of September and October. About 60 percent of the total area is disced

with tractors. The practice is to disc once or twice and then broadcast the seed with end-gate seeders. Seeding is at the rate of about 200 pounds per acre or about twice the rate used in the United States, and about 4 times that in the dryland areas of Brazil where the rice is dropped in hills by hand.

Rice is planted in October and November. After seeding, the levees are built by hand with shovels. Tractor graders were introduced several years ago, but they are used little. When the plants are from 4 to 6 inches high, the fields are irrigated. Of the total area planted, 56 percent is irrigated by pumping water from nearby streams, mostly with steam-engine operated pumps which take wood for fuel. About 31 percent of the planted area is irrigated by reservoirs and gravity-flow systems, and 13 percent by a combination of these two methods. Water usually is maintained on the land until about 3 weeks before harvesting.

Harvesting is begun early in April and completed in May. Rice is cut mostly by hand with scythes. Combines are being tried after having been introduced in 1939, but the area cut mechanically is still less than 1 percent of the total area harvested. The general practice is, after having cut the standing grain with scythes, to tie the stalks into small bundles and then stack in shocks about 5 feet high. Two to 3 weeks after shocking, the cut grain is hauled to stationary threshing machines. Those machines are modern types, imported mostly from the United States. Except for the fact that the unthreshed grain is hauled to the threshing machine in ox-wagons pulled by groups of from 4 to 8 oxen, and the threshed grain is then hauled to the warehouse or dryer in similar fashion, this threshing operation is very similar to the former practice in southern United States before combines were used. The straw stacks are utilized for cattle feed in the winter. Because of dampness during the harvesting season, most of the rough rice is dried in artificial dryers even though it has been shocked in the field. These dryers are of the upright type, similar to those used in the United States and in Italy, and are an essential item of equipment on all fairly large farms. Many of the smaller producers dry their rice on open-air wooden platforms.

Forty-four percent of the rice land is operated by owner-operator farmers and 56 percent by tenants. The tenants usually pay cash for rent or share-rent amounting to about 20 to 25 percent of the crop for the the land, including the fallow land used for their livestock, and supply their own irrigation facilities. There are about 6,500 rice farms in the State. Of these 50 percent cultivate less than 15 acres of rice per farm and the remainder, being fairly large farms, produce as high as 500 acres of rice. The usual rotation is rice on the land for one year, and fallow land, pastured with beef cattle for two years. There are about 850 tractors on rice farms in the State (more than one-third of all the tractors on farms in Brazil), mostly of the Case and International steel-wheel type from the United States. Mechanical irrigation pumps number about 1,600 of which most are of the steam-operated type. About 40 percent of the producers use fertilizers. From 90 to 180 pounds of bone meal is applied per acre of rice planted.

There are 50 fairly large rice mills in the State. These mills operate with old-type German machinery which mill efficiently the Japanese short-grain rice. Some of these mills are equipped to apply talc and glucose coating and they produce a glazed rice of the short-grain type which is equal in quality to that observed anywhere in the world. Average milling percentages for Japan short-grain rice are from 68 to 70 percent. The milled rice, on the average, consists of 62 percent so-called head rice (includes from 10 to 12 percent brokens of 1/2 grain size or larger), and 4 percent brokens of 1/4 to 1/2 grain size, and 3 percent brewers' rice. An additional 8 percent consists of bran and the remaining 23 percent is hulls and waste which are used for fuel. Typical Blue Rose percentages were reported to be 62 percent head rice (including 16 to 20 percent large brokens), 4 percent brokens, and 2 percent brewers rice, or a total yield of 68 percent. Milling percentages for the small volume of Agulha long-grain produced were reported to be 48 percent head rice (including 10 percent large brokens), 10 percent brokens, and 2 percent brewers' rice, or a total yield of only 60 percent.

Milled rice grades in general on the market in Rio Grande do Sul include 4 different grades: (1) Especial, with less than 2.5 percent striped grains, less than 2 percent chalky grains, less than 15 percent broken grains, and less than .03 percent yellow grains; (2) Primeira, or I-A with a tolerance down to 7.5 percent striped grains, 3 percent chalky grains, 30 percent broken grains, and .1 yellow grains; (3) Segunda, or 2-A, with a tolerance of 50 percent striped grains, 5 percent chalky grains, 60 percent broken grains, and 5 percent yellow grains; and (4) "4-A", with a tolerance of more than 50 percent striped grains, 5 percent chalky grains, 60 percent broken grains, and 5 percent yellow grains. These grades apply to both Japan short-grain and Blue Rose medium-grain rice. For Agulha long-grain rice, all specifications are the same except the broken-grain tolerance. This is higher, being less than 20 percent for Especial, less than 40 percent for Primeira, less than 60 percent for Segunda, and 60 percent or more for "3-A". Official Government grades consisting of 9 different classes were established in 1941 but they have not been accepted for general use by the trade who find that they make too many fine distinctions. These Government grades vary from "Tipo 1" with less than 0.5 percent striped grains, less than 2 percent chalky, less than 5 percent broken grains, and no yellow grains down to "Tipo 9", which is the same as "3-A" as given above. According to trade reports, exports from Rio Grande do Sul in recent years have been about 20 percent of the Especial grade, about 40 percent of the Primeira grade, and 40 percent of the Segunda grade.

Current prices for rice in the Porto Alegre area (May 1949) are as follows: Rough rice prices paid to producers are: (a) Japanese short-grain, $2.18 per bushel; (b) Blue Rose medium-grain, $2.62 per bushel; and (c) Agulha long-grain, $2.94 per bushel. These prices are about 22 cents above the minimum prices set by the Government. For the top grade of milled rice, Especial, wholesale prices are $7.87 per 100 pounds of milled rice of the Japanese type, $9.49 per 100 pounds for the Blue Rose, and $10.50 per 100 pounds for milled Agulha rice. Retail prices are 12 cents per pound for Blue Rose medium-grain, 9 cents per

pound per Japanese short-grain, and 14 cents per pound for Agulha long-grain.

Exporters of rice from this area, as well in other parts of Brazil, also have additional costs. There is a Government export tax of 5 percent of the average f.o.b. value. This tax was reported as being established when world rice prices were at a high level and the revenue is being used to help "less-fortunate" agricultural producers. It is subject to annual revision, depending on changes in world rice prices. Also, an additional 3 percent sales tax is assessed on all shipments to either domestic or foreign markets. Various miscellaneous charges on shipments are reported to average one-half to 1 percent, making a total of 8.5 percent additional costs in exporting rice.

Rice prices in the Rio Grande do Sul area and in the other regions of Brazil show little indication of declining. Prices have increased since 1941 and present indications are that a decrease is not expected in 1949.

Costs of production at the producer level are reported to be advancing also. According to the annual survey of costs conducted by the Institute do Arroz (The Rice Institute), average costs of rice production have increased from $70 per acre in the 1945-46 season to $93 per acre in 1948-49. Average yields per acre are reported to be about 57 bushels of rough rice. Labor and machinery costs are not expected to decline. Current labor costs on farms are from $1.34 to $1.60 per 8-hour day, or about double the rate of 4 years ago. The tractors used most commonly, the "Case-LA" and the "Massey-Harris 55", cost from $4,270 to $5,600. Gasoline costs to farmers are 39 cents per gallon; kerosene or tractor distillate, 29 cents per gallon; diesel fuel, 26 cents per gallon; and motor oil, 76 cents per gallon. Tractors, trucks, and all types of machinery parts have become scarce and high-priced in recent months. This is due to Brazil's dollar shortage and the resulting restrictions on imports.

In general, there appears to be little probability that Rio Grande do Sul will expand rice production substantially in the next few years. The current level of acreage, between 500,000 and 600,000 acres of rice annually, however, probably will be maintained for the next 3 to 5 years. Current plans of the State are for the construction of additional irrigation facilities to increase production by as much as 25 to 50 percent. Some of these plans will be completed, but others are likely to be abandoned because of high costs of construction in relation to export prices received for rice.

The area will continue to produce rice which will compete to some extent with United States rice in export markets. This competition will be restricted to short-grain rice. For the next 3 to 5 years indications are, because of larger demands for rice in central Brazil, that the volume available for export from the region will be less than the 335 to 546 million pounds exported annually from 1946 through 1948.

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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Argentina 1/

Argentina holds no promise as a possible future outlet for United States rice. In the next few years it probably will produce a volume about sufficient for domestic consumption. The country could raise rice for export, according to Dr. Efferson. It has good land and its producers are experienced in mechanized and large-scale farming. Exportable quantities of rice are not likely to be forthcoming in the near future but could be within the next 10 years.

The average annual per capita consumption of rice in Argentina, which has remained fairly stable, is only from 10 to 12 pounds, according to Dr. Efferson. This is from one-tenth to one-fifth as much as is consumed in most of the countries in South America. This low consumption of rice is due largely to the high per capita consumption of meat which is from 250 to 275 pounds annually, or about twice as much as in the United States. In Asia, the farmer or laborer customarily takes a container of cooked rice to the field or to his job. In Argentina, the worker carries from 2 to 4 pounds of fresh, raw meat, and at lunch time he builds a fire, sears the meat, and eats it. Since Argentina's population has continued to increase, however, the total demand for rice has also increased. The result has been that rice has become a relatively scarce commodity in that country in the last 2 or 3 years. According to trade reports, the 1947-48 crop was consumed in 10 months (May 1948 to February 1949), and rice supplies were not available for consumers during March and April. Because of Government restrictions on imports, rice has not been imported to relieve the situation and consumers have eaten more beef instead of rice.

Domestic production reportedly has not kept pace with the demand for rice because of a Governmental policy of fixing retail ceiling prices on the product, which discouraged expansion. The official prices to producers in 1948 were fixed at $2.56 per bushel for rough rice for short-grain, and at $2.68 per bushel for medium-grain. The official retail ceiling at which milled rice of the short-grain, and medium-grain variety, unpacked, was sold was 12 cents per pound.

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

Recently the Government changed this policy. A minimum price which millers were required to pay producers was established in April 1949 at $3.35 per 100 pounds for short-grain rough rice and $3.47 per 100 pounds for medium-grain rice. Retail prices for medium-grain rice rose to 19 cents per pound. Minimum price ceilings apparently were based on the results of a survey of production costs made by the rice producers' organization. The results of this survey indicated that average costs of rough rice production for the 1948-49 season were $3.23 per bushel.

If the policy is continued of establishing annual prices according to costs of production, the belief is that rice production in Argentina will increase. If maintained, production reportedly could be expected to increase from 10 to 20 percent next year and an additional 10 to 20 percent the following year. At that time all domestic requirements would be met.

Since official statistics are not released by the Government at the present time, an accurate picture of the current rice situation in Argentina is difficult to obtain. It appears that the recent estimate of the American Embassy, 128,000 acres planted and 5,880,000 bushels of rough rice produced, is a good estimate of the crop. Harvesting conditions in the areas of production have been unusually favorable this year and weather conditions permitted the harvest to extend almost a full month beyond the harvesting dates.

ARGENTINA: Rice acreage, production, and trade, 1929-30 to 1948-49

Year	Area Planted	Production	Imports	
			Milled rice	Rough rice
	1,000 acres	1,000 bushels rough	1,000 pounds	1,000 pounds
1929-30	9	295	158,850	--
1930-31	9	258	116,182	--
1931-32	16	506	36,301	60,413
1932-33	33	1,152	8,856	134,375
1933-34	47	1,642	414	109,983
1934-35	38	1,710	46	126,568
1935-36	36	1,642	2,844	76,348
1936-37	41	1,867	6,579	108,017
1937-38	54	2,352	104	110,812
1938-39	82	4,945	4	67,913
1939-40	82	4,752	0	24,447
1940-41	75	2,743	4,491	8,139
1941-42	84	5,296	346	148
1942-43	103	4,852	444	--
1943-44	138	8,559	0	--
1944-45	128	6,807	13,098	--
1945-46	122	6,339	224	--
1946-47	122	5,928	1/	1/
1947-48	128	5,497	1/	1/
1948-49	128	5,879	1/	1/

1/ Not available. Official statistics, except for 1948-49.

This series shows several interesting facts in the development of the rice industry in Argentina. The first important change was the sudden shift from the importation of milled rice to the taking of rough rice. This occurred in 1931 and it was the result of a new Government policy which imposed restrictive duties on milled rice to foster the domestic milling industry. The change greatly stimulated the domestic industry, since the acreage and production increased about 5 times from 1930 to 1935. The next important change was the gradual reduction of imports. This began in 1937 and in recent years only insignificant quantities have been taken. In 1946, exports totalled 17 million pounds. The domestic crop has become fairly stabilized at about 125,000 acres planted and from 5,500,000 to 7,000,000 bushels harvested, after reaching a peak of 8,600,000 bushels of rough rice in the 1943-44 season.

About 70 percent of the rice produced in Argentina appears to be the medium-grain type and 30 percent of the short-grain rice. Long-grain production is insignificant. On farms, short-grain rice usually is called "Japanese", and the medium-grain is termed "Blue Rose". Upon examination of samples, however, it appears that each of these types includes a mixture of several varieties. There is considerable variation in the size and length of the grain in the "Blue Rose" as well as in the short-grain type. Milled short-grain is called "Glace" by distributors and consumers, and milled medium-grain is known as "Carolina" rice. Although consumers apparently usually prefer the medium-grain "Carolina", the trade reports that due to the relative shortage of rice, consumers at the present time have little preference as long as they are able to buy rice. Long-grain rice is not consumed in Argentina.

The planting season for rice begins in September, reaches its peak in October, and is completed in November. Harvesting usually starts in March and is completed by the end of April although in some years it extends through May.

Rice is cultivated in the Provinces of Entre Rios, Corrientes, Santa Fe, Salta, Tucuman, and Misiones. Most of the commercial crop is produced in the northern part of the country due west of the major commercial area of Brazil, Rio Grande do Sul. Production specialists in Argentina, however, think that early-maturing varieties can be grown in large, lowland areas south of Buenos Aires.

Practically all the crop is produced on a fairly large scale and is irrigated. Some upland rice is grown in an area in the extreme north adjacent to the upland rice region of Central Brazil, but this production is minor and has no commercial importance. The land usually is plowed with teams of horses. Three to 5 teams are the rule, but occasionally there are as many as 8. Some land is plowed with tractors, and seeded with a grain drill. The usual spacing is 6 inches between the drills, although in some instances, spacing is 4.7 inches. Average seeding rates are 2.4 bushels per acre. In regions where weeds are especially thick, or where some of the seed may be destroyed by birds, up to 3.6 bushels per acre are seeded.

When the crop is 4 to 6 inches high, it is flooded and kept covered with water until just before harvest. In the important commercial areas of north-central Argentina, the water for irrigation is obtained from nearby streams. It is lifted by elaborate pumping systems to higher levels than is customary in most parts of the world where surface water is used for irrigation. On one farm, the water was lifted 15 yards from the river fronting the property up to the main canal. On another, the rent paid by the operator for the land was double the rent usually paid in the area because the source of water was nearby and required only an 8-yard lift. In this area, the relative scarcity of water and the expense of irrigation appear to limit the expansion of rice production. In the northwest, however, near the foothills of the Andes, gravity-flow irrigation systems are common. Although the land planted to rice usually is flat and is laid out in large fields similar to those in the United States, the levees generally are 2 to 3 feet high. They are laid out on rectangular lines rather than in contours, and are not constructed on gradual slopes. Before harvesting mechanically becomes widespread in Argentina, this system of rectangular levees would have to be changed in order to use labor-saving machinery efficiently.

Most of the crop is harvested as it is in Brazil. It is cut by hand, shocked in the field in shocks from 5 to 6 feet high, and then hauled to stationary threshing machines for threshing. In some regions, however, combines and binders are used. One farm visited by Dr. Efferson had 5 Massey-Harris self-propelled 12-foot cutter-bar combines in operation. This farm, the largest and most highly mechanized rice farm in Argentina, used 6 self-propelled units on an acreage of 3,000 acres. In addition, some of the crop was cut by hand. Due to the short harvesting season, it was believed one large self-propelled combine was necessary to use on each 250-300 acres harvested.

Whether rice is harvested by hand, binder, or combine, weather conditions make it necessary for it to be dried in a mechanical dryer in order that it keep well in storage. This is the principal reason that most of the rice farms in Argentina are fairly large, varying from 250 to 1,250 acres annually. To grow rice, one must have available a dryer on the farm or nearby. Consequently, the output must be sufficient to pay for the costs of maintaining a dryer. Rice usually is taken from the field with a moisture content of 25 percent and is reduced to about 15 percent for proper storage. The dryers are of the upright type similar to those in Brazil. They are manufactured in Argentina. Wood is used for fuel. There is a lack of cooperative drying facilities in Argentina probably because of the transitory nature of the rice enterprises there.

Practically all of the rice grown commercially in Argentina is produced by tenant farmers who lease for a 3- to 4-year period good land where water is available. The pumping equipment is moved to this lot, where levees, irrigation ditches, and drainage canals are built. When the typical "tar-paper" houses for the laborers are moved in, and the dryer is constructed, the grower is ready to produce the crop. Rice is grown continuously for 3 to 4 years, then when red rice and weed infestations make another rice crop unprofitable, the land is returned to the

owner for use as pasture. The tenant farmers then move to another area and follow the same practice. These growers establish their own pumping and irrigation facilities and usually pay for the rent for the land in cash. Current rental costs on an average are reported to be $12 per acre. Farmers are specialized and their capital is invested in work-stock, equipment, houses, and dryers to produce rice, and no capital is invested in the land. Fertilizers are not used and formal rotation practices are not followed. Some interest is apparent in the establishment of rice production on a more permanent basis so as to save high costs of moving every 3 to 4 years and also to reduce costs of irrigation, but little has been done in this regard so far. On one farm visited, a permanent system was planned which was based on a rotation of rice and alfalfa used for beef-cattle pasture.

Rice produced in this manner usually is heavily infested with red grains. In a large mill in Buenos Aires visited by Dr. Efferson, the milled rice contained about 15 percent red grains, and it was reported as typical. In this mill, one of the best in Argentina, a final product was produced which had only a trace of red striped grains in it. This product was obtained by careful milling, including 3 runs through the polishers. The mill had a capacity of 11,000 pounds of rough rice per hour. It was operated with German-type machinery which was old, but short-grain and medium-grain rice of good quality was being produced.

The standard quality, packed in 110-pound paper bags and 154-pound jute bags, contained 20 percent broken grains. The mill also sells a luxury package, in a 2-pound pastoboard box, with a broken grain percentage not to exceed 7 percent. It had efficient automatic packaging machinery for consumer-size containers. Costs of packaging in these 2-pound boxes, it was reported, were 3 cents per pound over the costs of putting the same product in 154-pound jute bags.

This mill, together with 20 other rice mills now in operation in Argentina, was coating all the milled rice with a glucose-talc. In the process, the liquid glucose solution and the powdered talc was placed by hand in small mixers, after milling and mixing-in of broken grains, but the product was uniformly coated and of good quality. The glucose-talc coating was reported to be necessary to the milling process. It was indicated that if it is not done, the milled rice becomes chalky within 2 months and is more susceptible to insect damage.

Millers reported that the average milling percentages for short-grain Japanese rice were 62 percent whole grains, 9 percent brokens, and 8 percent bran, and for the medium-grain Blue Rose type 60 percent whole grains, 8 percent brokens, and 8 percent bran. The whole-grain rice probably includes the usual 8- to 12-percent broken grains of larger sizes. Reportedly no general grades of milled rice are being used at the present time by the trade in Argentina. Prior to the war 5 major grade designations were used, depending on broken rice content and percentage of yellow grains, but in recent years rice sales are made on the basis of specific broken grain percentages.

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WORLD RICE PRODUCTION IN 1948-49 EXCEEDS PREWAR LEVEL

World rice production in 1948-49 (August-July) increased 4 percent over the preceding year's harvest and was 2 percent larger than the prewar average output, according to the estimate of the Office of Foreign Agricultural Relations. The harvest is estimated at 7,500 million bushels compared with 7,200 million in the year before and 7,300 million bushels before the war (1935-36/39-40).

This marked gain in production was the result of increased acreages planted and exceptionally favorable weather in a large number of countries. The world rice acreage harvested was the largest on record. Relatively small increases in many of the lesser producing countries combined to effect a large net gain in the total acreage, particularly in the regions outside Asia.

The production of Asia increased sharply over the preceding year's harvest, and it approximated prewar output for the first time since before the war. Europe produced its largest crop since World War II, and record crops were grown in Africa and North America. South American production, however, was only slightly larger than the year before, and was less than the record of 2 years earlier.

Asia's crop is estimated at 6,950 million bushels compared with 6,700 million in 1947-48 and a prewar average of nearly 7,000 million bushels. Although there was an increase in acreage in all the Asiatic countries except French Indochina and Indonesia, the greatest increases were in the importing countries. Good crops were harvested in China, India, Japan, the Philippines, Korea, Siam, Burma and French Indochina. Production was smaller in the Malayan Union.

China's rice acreage increased slightly in 1948. Weather conditions generally were favorable, and another good crop was harvested. The outturn is estimated at 2,360 million bushels from 45,617,000 acres. Before the war (1931-37) production averaged 2,453 million bushels from 48,853,000 acres.

The harvest of the Indian Union is estimated at 1,550 million bushels, a substantial gain over the 1,460 million reported the year before, and 11 percent larger than the average of 1,400 million before the war (1936-37/39-40). The unofficial estimate of Pakistan's production is 585 million bushels, which is 3 percent larger than in 1947-48

and 8 percent more than the prewar (1936-37/39-40) average of 540 million bushels.

Unusually favorable growing conditions in Japan and Korea resulted in the largest crops since the war. Japan's production of more than 570 million bushels was nearly up to the prewa r average, and the record crop of South Korea was about 3 percent larger than before the war.

Production in the surplus area, Siam, Burma, and French Indochina, was about 80 percent of prewar average output. The harvest of approximately 725 million bushels in 1948-49 was slightly less than the 740 million in the year before. Prewar production in these countries averaged 880 million bushels. The increased acreage of Siam, combined with exceptionally favorable weather, resulted in a harvest of 250 million bushels, one of the largest crops on record.

Burma's acreage increased 7 percent over that of the year before, but the yields per acre were substantially smaller. The production of about 265 million bushels, therefore, was less than in 1947-48. Acreage and production were reported at 78 and 76 percent, respectively, of the prewar average.

As the result of transportation difficulties within French Indochina, farmers there planted less rice. Accordingly, although climatic conditions favored the production of a large crop, less rice was produced than in the year before. Acreage and production are estimated at 70 and 66 percent, respectively, of the prewar average.

The Philippine acreage was the largest since the war and exceeded the prewar average by 400,000 acres, or 9 percent. High per acre yields were harvested, and the crop was one of the largest on record. Although the acreage of the Malayan Union increased about 4 percent, drought conditions in some areas caused a substantial reduction in the crop below that of the year before.

Production in the countries of Asia Minor was above average. The combined crops of Iran, Iraq, Syria, and Turkey totaled 45 million bushels compared with 33 million in the year before and 35 million bushels before the war. Favorable weather for production resulted in bumper crops in all except Syria.

During the last decade, the rice acreage of the continents outside Asia has increased sharply. The 1948-49 acreage in non-Asiatic areas is estimated at 16 million acres, a gain of 6.5 million acres over the prewar average. The production of these regions in 1948-49 totaled 520 million bushels, or 180 million bushels more than before the war.

Europe harvested its largest crop since the war. Production approximated 56 million bushels compared with 54 million in the preceding year and 53 million before the war. Although there was a substantial increase in Italy's planted acreage, the weather was less favorable and the volume harvested was about the same as in the year before.

That country's output was about 91 percent of the prewar average production.

Spain's crop also was large. Increased production has resulted primarily from an expansion of acreage. Postwar yields per acre have been only about three-fourths of prewar, because of fertilizer shortages. Although Portugal's acreage was increased, production was about the same as in the preceding year.

Africa produced the largest crop on record. Production of 174 million bushels was 3 million larger than in 1947-48, and 64 million more than prewar. The principal increase took place in Egypt where production of nearly 65 million bushels exceeded the previous record of 1947-48 by 2 percent. The harvest was nearly twice as large as prewar production.

A record crop was produced in North America for the fifth successive year. Production of 106 million bushels compared with 100 million in the year before and with 63 million bushels before the war. United States production of 81 million bushels was the largest ever harvested. This compared with 78 million in the preceding year, and the average of 50 million bushels before the war. The acreage was increased 50,000 acres over the record of the year before, and favorable weather in the southern States resulted in the highest per acre yields in several years.

Mexico, Panama, and Cuba also produced the largest crops on record. These countries increased their rice acreage, and climatic conditions were favorable for the production of large crops.

Although the acreage planted to rice in South America was increased 350,000 acres in 1948-49, it was not so large as the record of 2 years earlier. Drought conditions in some areas prevented a rise in production proportionate with increased plantings. The preliminary estimate of production is 159 million bushels, 2 million more than the year before, and 70 million bushels larger than prewar.

Brazil increased rice plantings by about 300,000 acres. Lack of rainfall in the main producing States, however, caused a reduction in the yields per acre, so that about the same volume was produced as in 1947-48. Dry weather in Peru also sharply reduced that country's production. A decline in Chile's output was the result of a drop in the planted acreage.

Record crops were produced in Ecuador, Colombia, Paraguay, Uruguay, Surinam (Dutch Guiana), and Venezuela. The acreage was increased in these areas. Production was larger than in the preceding year also in Argentina and British Guiana.

This is one of a series of regularly scheduled reports on world agricultural production prepared by the Office of Foreign Agricultural Relations Committee on Foreign Crops and Livestock Statistics. For this report, the Committee was composed of Joseph A. Becker, Chairman, C. M. Purves, L. Thelma Willahan, Olav F. Anderson, T. O. Engebretson, Constance H. Farnsworth, Lois B. Bacon, Afif I. Tannous, and Mary E. Long.

RICE, ROUGH: Acreage, yield per acre, and production in specified countries, averages 1935-39 and 1940-44, and annual 1946-1948 1/

Continent and country	Acreage: Average 1935-39	Acreage: Average 1940-44	Acreage: 1946	Acreage: 1947 2/	Acreage: 1948 2/	Yield per acre: Average 1935-39	Yield per acre: Average 1940-44	Yield per acre: 1946	Yield per acre: 1947 2/	Yield per acre: 1948 2/	Production: Average 1935-39	Production: Average 1940-44	Production: 1946	Production: 1947 2/	Production: 1948 2/
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Bushels	Bushels	Bushels	Bushels	Bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels
NORTH AMERICA															
Costa Rica	28	27	33	30	30	33.4	33.9	33.9	31.7	30.6	935	916	1,120	952	918
El Salvador	26	45	34	-	-	26.9	22.8	40.2	-	-	700	1,027	1,368	-	1,265
Mexico	95	155	157	179	183	42.2	34.4	43.1	37.7	40.2	4,007	5,330	6,760	6,752	7,350
Panama	50	3/ 79	114	128	134	32.0	3/ 29.3	23.4	23.3	27.5	1,600	3/ 2,318	2,669	2,987	3,691
United States	1,004	1,338	1,574	1,693	1,743	49.7	45.5	45.9	46.2	46.6	49,852	60,849	72,216	78,259	81,170
Cuba	45	69	107	105	123	21.4	23.0	22.4	27.3	24.4	965	1,587	2,400	2,870	3,000
Dominican Republic	80	90	87	77	114	36.3	40.9	45.4	42.1	37.1	2,905	3,683	3,951	3,243	4,229
Total	1,425	1,920	2,250	2,412	2,557	-	-	-	-	-	63,199	78,958	94,213	100,311	106,301
EUROPE															
Bulgaria	19	28	14	-	-	54.8	52.5	35.7	-	-	1,041	1,469	500	-	-
France	1	1	2	6	12	30.0	36.0	59.0	40.8	41.7	30	36	118	245	500
Italy	362	381	289	327	352	103.9	99.5	90.0	104.9	97.4	37,620	37,900	26,000	34,300	34,300
Portugal	47	62	62	64	77	72.3	61.2	49.5	65.1	54.1	3,398	3,795	3,068	4,165	4,165
Spain	110	121	125	130	137	4/ 124.4	95.9	80.6	98.0	97.1	10,600	11,500	10,070	12,740	13,300
Total (excl. U.S.S.R.)	553	616	524	578	661	-	-	-	-	-	53,163	55,610	40,724	54,047	56,436
U.S.S.R. (Europe and Asia)	3/ 384	-	335	-	-	3/ 42.3	-	-	-	-	3/ 16,225	-	-	-	-
ASIA															
Iran	3/ 534	580	544	544	544	3/ 37.1	36.4	37.8	28.7	39.6	18,577	21,100	20,576	15,607	21,556
Iraq	3/ 386	479	-	-	-	3/ 27.3	31.1	-	-	-	11,176	14,904	14,200	12,740	18,100
Syria	2	3	19	20	-	55.5	61.0	50.7	52.9	-	111	183	964	1,057	735
Turkey	78	66	44	59	59	61.2	59.2	66.8	68.5	76.0	4,774	3,905	2,939	4,042	4,482
Burma	12,671	10,650	7,788	9,286	9,921	27.5	25.8	25.0	29.5	26.7	348,534	275,000	194,942	274,310	264,708
China	5/ 48,853	45,000	45,165	45,373	45,617	5/ 50.2	48.9	49.9	50.2	51.7	5/ 2,452,710	2,200,000	2,253,921	2,278,436	2,360,000
Taiwan	1,616	1,539	1,435	1,631	1,782	53.0	47.1	41.1	44.0	42.1	85,704	72,505	59,015	71,727	75,000
Manchuria	782	975	-	-	-	40.6	35.2	-	-	-	31,783	34,336	-	-	-
French Indochina	14,306	13,000	9,750	10,650	10,000	22.4	21.9	21.5	22.1	21.0	319,910	285,000	210,000	235,000	210,000

ASIA (Continued)															
India 6/	1/ 54,237	55,672	60,987	60,818	61,000	1/ 25.8	24.6	24.3	24.1	25.4	1/ 1,399,525	1,369,943	1,484,057	1,463,728	1,550,000
Japan	7,862	7,653	7,700	7,830	7,850	75.8	72.7	72.9	70.7	73.4	595,845	556,057	561,076	553,408	576,322
Java and Madura	9,794	9,330	8,850	9,000	7,593	32.0	32.6	30.5	30.6	34.4	313,144	304,465	270,000	275,000	260,972
Korea	3,838	3,601	8/ 2,712	8/ 2,753	8/ 2,748	51.0	50.4	8/ 42.3	8/ 47.9	8/ 55.9	195,763	181,601	8/ 114,792	8/ 131,983	8/ 153,722
Malayan Union	746	790	797	862	900	36.3	31.6	25.5	30.4	24.4	27,099	25,000	20,322	26,207	21,970
Pakistan	1/ 18,702	20,605	20,959	21,036	21,400	1/ 29.0	27.3	27.7	27.1	27.3	1/ 542,321	561,708	579,616	569,900	585,000
Philippine Islands	4,852	5,265	4,816	5,007	5,267	21.6	20.9	22.4	21.9	22.4	104,877	110,000	107,689	109,782	118,219
Siam	7,088	6,750	5,500	6,700	7,100	30.1	29.6	30.9	34.3	35.2	213,079	200,000	170,000	230,000	250,000
Total (excl. U.S.S.R.)	198,726	196,471	193,781	198,690	199,119	-	-	-	-	-	6,988,472	6,580,531	6,488,981	6,717,159	6,954,326
SOUTH AMERICA															
Argentina	52	91	122	128	128	59.8	62.1	48.6	42.9	45.9	3,112	5,652	5,928	5,497	5,879
Brazil	2,323	3,042	4,166	3,756	4,080	28.6	31.3	31.9	29.2	27.0	66,424	95,237	132,779	109,500	110,000
British Guiana	70	83	98	107	95	50.8	48.9	50.9	44.5	52.4	3,559	4,055	4,993	4,760	4,976
Chile	13	68	80	70	60	99.9	75.9	53.4	62.6	67.3	1,299	5,162	4,274	4,381	4,035
Colombia	-	-	-	-	375	-	-	-	-	29.0	3,142	5,948	7,410	10,230	10,887
Ecuador	-	-	-	-	-	-	-	-	-	-	3,417	5,948	8,944	6,945	9,100
Paraguay	5	12	12	10	20	39.2	35.2	30.6	41.6	42.9	196	422	367	416	857
Peru	107	137	114	132	94	42.8	49.0	63.7	76.8	68.3	4,578	6,716	7,261	10,132	6,420
Surinam	37	33	40	-	45	46.0	56.6	62.7	-	63.6	1,703	1,867	2,507	1,889	2,861
Uruguay	13	13	25	31	33	66.6	63.6	68.9	58.8	63.5	866	827	1,723	1,824	2,095
Total	2,914	3,999	5,339	4,915	5,264	-	-	-	-	-	88,926	131,671	177,829	156,900	158,943
AFRICA															
Egypt	463	600	656	805	816	71.6	60.1	70.1	77.7	78.5	33,135	36,049	45,973	62,533	64,074
French West Africa	3/ 1,562	1,860	2,510	-	-	3/ 13.4	13.3	13.7	-	-	3/ 20,936	24,700	34,300	-	-
Madagascar	1,195	1,227	1,430	1,430	1,430	28.3	28.4	24.0	24.0	24.0	33,823	34,851	34,300	34,300	34,300
Sierra Leone	340	-	-	780	780	26.8	-	-	17.0	17.0	9,100	-	-	13,230	13,230
Total	4,320	5,483	6,810	7,051	7,127	-	-	-	-	-	109,816	127,446	154,788	170,692	174,152
OCEANIA															
Australia	23	30	32	26	32	92.0	82.1	86.8	96.1	81.6	2,117	2,462	2,779	2,498	2,610
Fiji	10	22	25	25	-	43.1	45.7	47.2	-	-	431	1,006	1,180	-	-
Total	40	72	88	85	92	-	-	-	-	-	2,703	3,918	4,739	5,448	4,585
WORLD TOTAL	208,400	208,600	209,100	214,100	215,300	-	-	-	-	-	7,323,000	6,994,000	6,972,000	7,219,000	7,473,000

1/ Crops harvested in Northern Hemisphere countries during the latter part of the year, together with those harvested in Asia principally from November to May, are combined with crops harvested in Southern Hemisphere countries during the first part of the following year. 2/ Preliminary. 3/ Less than 5-year average. 4/ Average 1930-34. 5/ Average 1931-37. 6/ Includes acreage and production in areas regularly reported only. 7/ Average 1936-39. 8/ South Korea only. In the 1935-39 period, production averaged about 150 million bushels.

Office of Foreign Agricultural Relations. Prepared or estimated on the basis of official statistics of foreign governments, reports of U.S. Foreign Service officers, results of office research, and other information.

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WORLD RICE TRADE INCREASES IN 1948; STILL BELOW PREWAR

International trade in rice during 1948 increased markedly over the preceding year and was nearly 45 percent of the average prewar trade. World exports totaled 8,700 million pounds compared with 6,000 million the year before, and with an average of 20,000 million pounds during the 1936-40 period.

The largest actual gain in exports occurred in the surplus countries of Asia. Exports from Africa were twice as large as in 1947, while those in Europe increased only slightly. Exports from North America and South America showed a moderate decrease compared with the preceding year's record.

Before World War II, Asia was the only Continent that had net rice exports. Decreased production in its exporting countries since the war has made it necessary for Asia to import from other continents. By 1948 it had not yet become self-sufficient in rice. Exports of the other continents, with the exception of Europe, exceeded imports.

Asia's exports in 1948 totaled 6,100 million pounds compared with 3,800 million in 1947, and 2,300 million in 1946. The 1948 exports were about one-third of the average (1936-40) of 18,500 million pounds before the war.

Exports from the principal surplus area of Asia, comprised of Burma, Siam, and French Indochina, were 42, 61 and 13 percent of prewar, respectively. Civil disturbances in Burma beginning in August 1948 reduced exports below the amount programmed for shipment. Exports from Siam, however, were substantially larger than the quantities allocated for delivery.

Asiatic importing countries during 1948 received about 80 percent of the world's rice imports. Although receipts of 7,100 million pounds were 48 percent larger than in 1947, they were only one-half of the prewar average. The major importing countries in order of volume were India, the Malayan Union, Ceylon, China, Indonesia, the Philippines, Hong Kong, South Korea, and Japan.

RICE, IN TERMS OF MILLED: International trade, average 1936-40, annual 1946 to 1948

Continent and country	Average 1936-40		1946		1947 1/		1948 1/	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
NORTH AMERICA								
British Honduras	-	2,764	-	3,426	-	2,497	-	2,627
Canada	2,525	50,958	3	26,018	6	38,441	5	38,794
Costa Rica	0	2,053	1,000	11	1	24	1,624	715
El Salvador	2,641	3	547	-	8,012	-	4,126	-
Guatemala	2/	75	2/	567	1,135	2	259	1
Honduras 3/	1	2,591	728	1	4,856	37	3,187	-
Mexico	18,555	347	3	3,293	22,090	4,460	63,049	42
Nicaragua	150	518	11,228	0	8,023	-	8,195	-
Panama	-	13,398	-	7,222	-	14,637	-	10,559
United States	235,206	20,534	772,592	3,483	963,002	610	868,565	2,845
Bahamas	-	3,809	-	2,270	-	1,669	-	-
Barbados	-	20,675	-	16,059	-	13,432	-	5,544
Jamaica	-	41,798	-	14,947	-	11,521	-	-
Trinidad and Tobago	-	42,376	-	24,173	-	20,608	-	27,229
Cuba	60	444,612	1	330,464	1	620,639	-	517,715
Dominican Republic	165	7,989	8,397	2/	1	8,167	511	-
Guadeloupe	-	15,467	-	8,349	-	10,040	-	12,802
Martinique	-	6,508	-	5,240	-	7,013	-	-
Haiti 4/	1	2,359	2,357	2/	1,544	2/	219	826
Total 5/	259,775	690,821	796,856	454,523	1,008,671	763,297	949,740	656,199
EUROPE								
Austria	6/ 5	6/ 62,366	-	-	0	1,127	0	1,278
Belgium	29,249	140,798	22	7,870	18	36,251	-	-
Czechoslovakia	3	84,898	-	-	-	-	-	-
Denmark	45	19,082	0	5	0	0	0	2,159
Eire	0	7,909	0	0	-	-	-	-
Finland	0	31,723	0	7	0	4	-	-
France	31,120	1,239,561	6	10,478	136	24,778	14	75,733
Germany	38,288	483,566	-	-	-	-	-	-
Greece	0	63,719	-	507	-	23,589	-	63,933
Hungary	0	43,438	-	-	-	-	-	-
Iceland	0	1,249	0	723	-	979	-	1,116
Italy	355,639	1,400	2	0	0	1,653	45,587	0
Netherlands	187,911	378,363	0	0	46	1,649	368	10,412
Norway	420	11,157	0	3	0	1	0	430
Poland	20,315	92,923	0	1.638	-	-	-	-
Portugal	186	16,641	675	3,955	46	23,073	21,796	15,711
Rumania	1,303	46,597	-	-	-	-	-	-
Spain	6/ 11,695	6/ 81,733	14,291	73	19,835	6,736	-	-
Sweden	109	33,374	0	52	0	17	0	1,446
Switzerland	14	58,594	2	178	2/	20,946	0	47,847
United Kingdom	12,202	311,174	12,224	16,585	-	10,361	-	94,669
Yugoslavia	6/ 153	6/ 45,168	-	-	-	-	-	-
Total 5/	671,768	3,264,764	27,222	45,691	20,081	160,967	67,765	401,234
U.S.S.R.	6/ 2,403	6/ 94,300	-	-	-	-	-	-

RICE, IN TERMS OF MILLED: International trade,
average 1936-40, annual 1946 to 1948
continued--

Continent and country	Average 1936-40		1946		1947 1/		1948 1/	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
ASIA								
Aden	42,015	49,996	-	-	-	-	-	-
Iran 7/	64,129	1,252	130,454	179	27,172	55	-	-
Iraq	13,029	84	5,203	3,935	3,514	4,026	-	-
Palestine	2,381	41,020	0	16,499	-	-	-	-
Syria	18	37,646	-	26,455	-	47,551	-	-
Turkey	10	156	0	-	11	24	7	396
British Borneo	-	6/ 128,806	-	-	-	-	-	-
Burma	6,535,742	-	959,829	-	1,779,012	-	2,724,947	-
Ceylon	7	1,219,294	1,098	568,284	1,214	581,062	2,042	917,056
China	26,840	870,994	1,559	8/ 460,000	1,871	673,020	10,639	8/ 850,000
Manchuria	6/ 10,485	6/ 178,904	-	-	-	-	-	-
Taiwan 9/	1,426,661	8,321	-	-	10/ 880,000	-	10/ 800,000	-
French Indochina	3,232,998	11,519	160,000	-	148,429	-	433,413	-
Hong Kong	602,314	1,075,402	-	-	-	8/ 200,000	-	8/ 250,000
India 11/	622,218	3,726,688	4,295	8/ 630,000	4	8/ 1,120,000	-	1,959,021
Japan 9/	12/ 231,632	12/ 4,122,395	-	35,024	-	6,129	-	123,998
Korea 9/	2,367,393	72,735	13/ 0	13/ 0	13/ -	13/ 83,700	13/	13/ 171,337
Malayan Union	369,852	1,746,239	4,354	8/ 540,000	3,554	523,437	-	1,018,304
Indonesia	14/ 73,737	14/ 499,118	-	-	3,866	260,984	772	404,495
Philippines	1,316	130,886	-	258,236	-	159,895	-	264,797
Portuguese India	62	54,736	-	-	-	-	-	-
Siam	2,920,437	-	983,913	-	871,002	-	1,790,633	-
Total 5/	18,543,276	13,993,564	2,275,705	3,104,543	3,799,649	4,753,383	6,103,453	7,052,904
SOUTH AMERICA								
Argentina	467	52,286	8,638	1	5,955	-	-	-
Bolivia	0	18,371	-	25,079	-	9,469	-	20,005
Brazil	83,335	0	362,422	-	530,885	-	475,296	-
British Guiana	34,296	5	50,671	-	43,962	-	39,267	-
Chile	3	24,107	78,497	-	5,954	-	1,252	-
Colombia	3	29,614	14,178	1,029	-	13,452	-	9,921
Ecuador	25,685	4	129,769	-	136,659	-	138,853	-
French Guiana	0	2,692	-	1,870	-	913	-	1,892
Paraguay	0	327	0	101	0	0	2/	882
Peru	51	44,742	0	6,702	0	2/	0	5,071
Surinam	10,654	4	-	-	-	-	38,897	-
Uruguay	3,775	191	1,545	4,723	-	-	27,196	-
Venezuela	0	32,924	-	33,995	-	29,235	-	33,000
Total 5/	158,269	205,267	655,720	73,500	723,415	53,069	720,761	70,771

Continued - - -

RICE, IN TERMS OF MILLED: International trade, average 1936-40, annual 1946 to 1948
continued--

Continent and country	Average 1936-40		1946		1947 1/		1948 1/	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
AFRICA								
Algeria	4,918	65,224	-	4,435	-	-	-	-
Sudan	252	6,719	-	4,669	-	6,078	-	14,467
Belgian Congo	3,132	611	22	7,870	7,237	-	2,215	-
Nyasaland	6/ 23	6/ 30	664	-	1,145	-	-	-
Tanganyika	980	21,805	157	45	5,858	0	14,448	0
Zanzibar	436	38,033	6	222	2/	1,392	-	-
Gambia	-	11,245	-	0	1	-	-	-
Egypt	276,601	4,150	448,227	9	367,053	1	772,955	2
Italian Somaliland	0	12,820	-	-	-	-	-	-
Fr. Equatorial Africa	-	6,524	-	1,116	-	3,907	-	-
French Cameroons	-	6,208	-	2	-	1,058	-	1,082
French Morocco	-	24,719	-	3,086	-	441	-	15/ 8,377
French West Africa	534	180,336	-	7,110	0	65,871	-	16/ 94,313
Gold Coast	8	24,942	-	0	-	0	-	0
Liberia	-	6/ 5,556	-	1,478	-	-	-	-
Madagascar	15,942	3,848	11,971	0	3,790	2,204	1,033	25,819
Mauritius	34	123,091	-	41,076	1,873	45,224	-	-
Mozambique	215	18,341	3,164	3	-	-	-	-
Nigeria	-	21,376	48	111	6,952	4	-	-
Angola	3,422	216	8,657	0	4,770	0	11,063	0
Portuguese Guinea	9,634	0	3,452	0	-	-	-	-
Reunion	-	67,465	-	23,596	-	19,246	-	60,382
Seychelles Islands	-	6/ 5,990	-	853	-	3,741	-	-
Southern Rhodesia	75	2,249	46	1,513	1	823	-	-
Tunisia	-	45,418	-	11	-	-	-	53,124
Union of South Africa	0	139,021	0	31,290	-	-	-	-
Total 5/	318,631	928,416	476,561	148,040	402,680	216,586	810,714	386,258
OCEANIA								
Australia 17/	29,025	5,268	53,474	2	64,344	-	-	-
Australian New Guinea	-	6/ 21,840	-	-	-	-	-	-
French Oceania	-	6/ 3,047	-	463	-	2,914	-	-
New Caledonia	238	7,183	-	2,328	-	4,134	-	7,566
New Zealand	17	8,542	-	2,637	-	4,234	-	2,510
Western Samoa	-	1,314	-	500	-	1,046	-	-
Total 5/	29,285	101,077	53,474	43,170	64,344	47,378	65,000	55,076
World total 5/	19,983,407	19,278,209	4,286,000	3,940,000	6,019,000	6,095,000	8,717,000	8,672,000

1/ Preliminary. 2/ Less than 500 pounds. 3/ July-June. 4/ October-September. 5/ Including countries not shown. 6/ Less than 5-year average. 7/ March 21-March 20. 8/ Estimated on the basis of export data from exporting countries. 9/ Prewar shipments to Japan from the Japanese colonies, Korea and Taiwan, comprised the principal trade of the 3 lands. 10/ Estimated surplus for shipment to China. 11/ March-April to 1940-41. Includes Pakistan to August 15, 1947. 12/ November-October. 13/ South Korea. 14/ Netherlands Indies. 15/ 10 months only. 16/ 11 months only. 17/ July-June.

Office of Foreign Agricultural Relations. Prepared on the basis of official statistics of foreign governments and reports of U.S. Foreign Service officers. Includes milled, broken, semi-milled unconverted and rough rice in terms of milled.

Although the trade of European countries gained perceptibly over 1947, exports and imports were only 10 and 12 percent, respectively, of the prewar average. Rice was exported from Italy for the first time since the war, but shipments were less than 15 percent of the prewar average. The principal countries in which rice imports increased were the United Kingdom, France, Greece, Switzerland, and the Netherlands.

Africa's total exports were more than twice those of prewar, due wholly to a sharp rise in the exports of Egypt. A marked gain in imports into Africa's deficit countries was due largely to increased availability in the exporting countries of Asia.

Exports from the Western Hemisphere countries were less than in 1947, being slightly smaller both in North America and South America. Western Hemisphere exports, however, were 4 times as large before the war.

In North America, the volume exported from the United States, El Salvador, and Honduras was less than the record of the preceding year. Mexico's exports, having declined during the war and immediate postwar years, exceeded the previous record of 1942. Those from Nicaragua were slightly larger than in the year before. The principal reason for a reduction of imports in North America was a decline in Cuba's purchases.

Decreased exports in the principal surplus countries of South America were offset largely by substantial gains in the exports of Surinam (Dutch Guiana) and Uruguay. Brazilian exports dropped 11 percent below the record of the preceding year, and exports were smaller also in British Guiana and Chile. Record shipments from Ecuador showed a very moderate increase over 1947. South American countries imported approximately 70 million pounds, or nearly 20 million more than in 1947. The principal countries in order of volume were Venezuela, Bolivia, Colombia, and Peru.

FOREIGN AGRICULTURE CIRCULAR

OFFICE OF FOREIGN AGRICULTURAL RELATIONS
UNITED STATES DEPARTMENT OF AGRICULTURE
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BOLIVIA CONTINUES TO IMPORT RICE

Bolivia's rice import requirements in 1949 are estimated at 17.8 million pounds, of which 9.9 million were imported during the first half of the year, according to information transmitted by the American Embassy, La Paz. Import needs in 1950 are likely to remain somewhere between 15 and 20 million pounds.

The present level of imports is about the same as before the war. Rice consumption in 1948 is estimated at 44 million pounds of milled rice. Of this amount, 24 million was from domestic production, and the remainder from imports. In 1948 imports totaled 20,005,000 pounds, of which only 181,000 came from the United States.

BOLIVIA: Imports of milled rice by country of origin, average 1937-41, annual 1944-48

Country of origin	Average 1937-41	1944	1945	1946	1947	1948
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
India and Burma	3	0	0	0	0	0
Brazil	3	1	1	1	1	10
Argentina	1	1	7	2	3	2
Chile	1/8	23	16	22	5	1
Uruguay	2/	2/	2/	2/	2/	4
Other countries	6	0	0	3/	3/	3
Total	21	25	24	25	9	20

1/ Apparently re-exports.
2/ If any, included in "Other countries."
3/ Less than 500,000 pounds.

Compiled from official statistics.

The import requirements from August through December 1949 are estimated at between 6.5 and 9 million pounds. Of this amount, approximately 1.2 million pounds had been purchased by August 1, all in markets outside the United States. The maximum quantity which might be bought after that date, therefore, would be something like 7.7 million pounds.

Information obtained from trade representatives in Bolivia indicates that American rice could probably compete favorably in the local market and some might be purchased immediately. The type of rice preferred in the La Paz market is up

to 30 percent broken and 2 percent spotted. Rice for the Bolivian market preferably should be packed in new jute bags with a capacity of one quintal (101.4 pounds). Quotations per quintal c.i.f. Arica are preferred. A quotation of $8.50 per bag ($8.38 per 100 pounds) c.i.f. Arica would be attractive.

Data are not available regarding stocks of domestic rice on hand, but a large part of the 1949 crop probably has not yet been consumed, since the new harvest was completed in April.

Bolivia's 1948-49 crop is officially reported at 871,000 bushels of rough rice (25 million pounds milled) compared with 817,000 bushels (24 million pounds) in the year before. Provided average weather prevails, the 1949-50 production is expected to be in the neighborhood of 925,000 bushels (27 million pounds).

Approximately 70 percent of Bolivia's rice is produced in the Department of Santa Cruz, and the rest is grown in the Departments of Beni and Pando and in the Chapare region of Cochabamba. The locality of production is significant because of the difficult access to the rest of the country, where most of the population is concentrated. Most of Bolivia's rice therefore is consumed where it is produced.

The Ministry of Agriculture expects that imports will decline within the next few years as production continues to increase. The attainment of self-sufficiency, however, will be in large measure dependent on the building of roads between the producing regions and the principal centers of population. The completion of the Cochabamba-Santa Cruz highway would place the Department of Santa Cruz in a position to supply nearly all the requirements of the country.

Less important factors which will influence the rate at which Bolivia attains self-sufficiency in rice are the acquisition of additional milling machinery and the degree to which an increase in production may lead to a larger consumption in the producing areas.

On August 1 the wholesale price for domestic rice in Santa Cruz, the principal producing region, was reported as fluctuating around $7.45 per 100 pounds. The following prices have been established by the Ministry of National Economy for imported rice in the consuming centers (bolivianos per Spanish quintal of 101.4 pounds): La Paz, 600 (14 cents per pound); Oruro, 610 (14.2 cents per pound); Cochabamba, 620 (14.4 cents per pound); Potosi, 630 (14.7 cents per pound; and Sucre, 640 (14.9 cents per pound).1/

1/ The official rate of exchange, 42.42 to the dollar, is used to convert bolivianos into United States currency.

Based on two reports by William P. Hudson, Second Secretary of Embassy, American Embassy, La Paz, Bolivia.

FOREIGN AGRICULTURE CIRCULAR

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UNITED STATES DEPARTMENT OF AGRICULTURE
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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Chile and Peru 1/

Neither Chile nor Peru is likely to be important in world rice trade during the next few years. These countries are not expected to export a significant volume. Chile has a production level sufficient to provide rice for domestic needs, and Peru may import some rice in years when lack of water reduces the domestic crop.

Chile

Chile is not likely to again become an importer of rice. The country has a shortage of foreign exchange and its ability to produce rice has been clearly demonstrated. On the other hand, several factors indicate that Chile may not maintain its wartime position as an exporter of rice. Yields per acre have been declining, world prices are lower, and internal costs of production have increased. In addition, prices fixed by the Government are relatively less favorable for rice than for other crops and lower profits may prevent a speculative expansion. Prospects for the next 5 years, therefore, indicate that production will be about equal to domestic needs and that only a small volume will be exported when per acre yields are above average.

The rice history of Chile in the last decade has been unusual. It provides a good illustration of the ease with which a country can go into or out of rice production in a relatively short period of time. Early in the 1930's, Chile was producing practically no rice. About 10 years later, almost 120,000 acres were planted and more than 7,350,000 bushels of rough rice were harvested. Whereas around 33,000,000 pounds in terms of milled rice were imported annually in the 1933-37 period, more than 88,000,000 pounds were exported in 1944-45. Since that year of peak production, the crop has declined with almost equal rapidity. Production in 1948-49 is about one-half that of only 5 years ago (Table 1).

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

Table 1. CHILE: Rice acreage, production, and trade, 1933-34 to 1948-49

Year	Planted acreage	Yield per acre	Production		Imports 1/	Exports 1/
			Rough	In terms of milled		
	1,000 acres	Bushels	1,000 bushels	1,000 pounds	1,000 pounds	1,000 pounds
1933-34	185	81.1	15	439	33,997	-
1934-35	277	86.6	24	702	30,631	-
1935-36	492	99.6	49	1,433	35,562	-
1936-37	2,718	62.9	171	5,002	39,226	-
1937-38	10,119	65.3	661	19,334	26,751	-
1938-39	20,485	79.1	1,620	47,385	18,576	-
1939-40	32,820	79.1	2,595	75,904	880	-
1940-41	32,017	68.9	2,206	64,526	159	8,598
1941-42	38,115	78.9	3,008	87,984	-	18,635
1942-43	71,155	75.1	5,341	156,224	-	50,715
1943-44	90,856	81.4	7,395	216,304	-	61,134
1944-45	109,505	71.8	7,862	229,963	-	91,700
1945-46	118,522	48.8	5,778	169,007	-	74,088
1946-47	79,539	53.7	4,274	125,014	-	5,952
1947-48	69,702	62.9	4,381	128,144	-	1,252
1948-49	60,105	67.1	4,035	118,024	-	-

1/ Data are in terms of milled rice, and are for the calendar year following planting.

Source: Office of Agricultural Attache, American Embassy, Santiago.

The expansion from 1933 to 1944 resulted from a combination of factors. Chilean business men in the early days of the depression began to look for other sources of foreign exchange when exports of nitrate of soda and copper declined. They began to experiment with rice because there appeared to be a profitable export market. About that time, they developed irrigation methods whereby the cold water from the mountain streams could be warmed by holding it in shallow canals and fields. In this way relatively high rice yields were obtained from medium-early varieties. Thus, rice production on a commercial basis started as an experiment by large land owners.

The most rapid large-scale expansion took place between 1940 and 1945. Higher prices caused by the reduction of exports from Asia made rice a profitable export crop. Due to the necessity of having milling facilities and dryers, however, it still remained a crop for the "big farmer." About 95 percent of the rice in 1942-43 was produced by 130 growers, and the indications are that this is true for most of the 1948-49 crop. Prices were favorable for production from 1940 to 1945 and yields per acre were unusually high in these first years when the crop was planted on virgin land. Rice growing became something of a fad and business men started renting and planting land as a speculative venture.

Production began to decline rapidly after 1945. The most important reason appears to be a decline in yields. While Chile's average per acre yields varied from 70 to 80 bushels of rough rice in the seven seasons before 1945-46, the average yield that year was less than 50 bushels per acre. Since much of the crop was being financed and produced by relatively few business men, their costs were too high to make a profit on lower yields. Per acre yields since 1945-46 have remained much lower than before. More recently, the establishment by the Chilean Government of guaranteed minimum prices for certain other crops has tended to hold rice production down. Thus, although world rice prices continued to increase until 1948, production in Chile declined, and it is now at that level where it barely supplies domestic requirements.

Reasons for the decline in yields appear to be: (1) a natural decline in the fertility of virgin land after repeated use for the same crop without rotation or fertilization; (2) infestation of the land with weeds which are water-tolerant, practically impossible to eradicate, and which continue to increase where rice is produced on the same land for several years; (3) a gradual deterioration of original seed stock; and (4) a lack of fertilizers. The weed problem could be solved in time by proper rotation and chemical weed-control methods. Varieties could be adapted, and fertilizers could be used, but these developments are likely to be slow while prices are relatively low.

Chile's rice area is located in the central valley south of Santiago. A small amount of rain falls in the valley during the winter months but practically none falls during the spring and summer growing season (October to March). Therefore the water for irrigation is from rapid mountain streams and is unusually cold. Sometimes it is held in the sun in shallow canals or open diked fields before it is used to flood the fields.

With fairly low temperatures in the winter months (April to September), the growing season for rice appears to be restricted to a maximum of about 160 days. The 120-day varieties are preferred, since they can be harvested easily before the winter rains. The crop is seeded in October and November and harvested in February and March. Although there appear to be no pure-line varieties, and there is variation in the size and type of grain in the samples which were examined, Chilean rice is a medium-grain type. The varieties which were found to be best adapted were the Early Prolific and Blue Rose.

Most of the rice is produced by on-farm hired laborers who are paid a straight daily wage plus a small share of the crop. No established rotation is in use. The land usually is plowed in the winter or early spring and is harrowed just before planting. About 70 percent of the planted area is plowed with oxen teams and mouldboard plows while the remaining 30 percent is plowed with tractors, mostly disc plows. Nearly all the harrowing is with spike-tooth harrows drawn by oxen. When rice was first grown in Chile, most of the crop was seeded in nursery plots. About 12 bushels per acre were used, which produced plants to transplant 35 acres. In recent years, however, as a

result of a larger planted area and the high cost of labor farmers have shifted to broadcasting. Less than 10 percent of the 1948-49 crop was transplanted. The usual seeding practice now is to flood just before planting, harrow the flooded fields, and broadcast presoaked seed by hand in the puddled fields. Some producers report planting 3 bushels, and others as much as 4 bushels per acre, so that a dense stand will partly crowd out the weeds.

The field is "given a bath" after planting by being flooded to a depth of from 1½ to 2 inches then drained after a day or two to let the soil warm up. After a good stand is obtained more water is added, and 6 to 8 inches of water is left on the fields from about December 1 until late February or March. The water is drained off two to three weeks before harvesting. Some producers drain the field once or twice during the growing season to "let the rice plants warm up a bit." The levees, in most cases made by hand, are usually built or rebuilt just before the land is flooded for planting. They are mostly of the contour-type, but are narrow and steep.

The crop is cut by hand, shocked and left in the field to dry for a week to 10 days. It is then threshed in stationary threshing machines which in most cases are operated with tractor power. The farms do not have dryers and if rice is threshed wet it is dried as a part of the milling operation after it reaches the mill. Neither is any rice stored on farms. In a 6-weeks harvesting period the miller usually must take in all of the rough rice which he expects to mill during the season and provide storage space for it.

Millers report that about one-sixth of the rough rice harvest contains 15 percent of moisture; one-sixth, 16 percent; nearly one-third, 17 percent; one-fifth, 18 percent; and one-fifth has a moisture content varying from 19 to 30 percent. They report that rough rice with a moisture content of less than 17 percent will keep satisfactorily and produce a reasonably good milled product, but that the 40 percent of the crop which has a moisture content higher than 17 percent must be dried before storing. Even after drying, this rice is low in quality because of deterioration between the time it was threshed and the time it was dried at the mill.

The average percentage of products obtained per unit of rough rice milled are: head rice, 45 percent; broken rice, 20 percent; brewers grains, 2 percent; and bran, 9 percent. The 24 percent of hulls and waste usually is used for fuel in operating the mills. Since the industry is of comparatively recent origin, most of the 21 commercial rice mills have relatively new and efficient milling machinery which was obtained during the early years of the war, and it appears similar to rice-milling machinery in various parts of the world. The rice produced in these mills was a good-quality, medium-grain rice. Except for a higher-than-average breakage, it would meet the standards of most importing countries of the world. This breakage is caused by that portion which is too high in moisture content, and by a wide variation in the size and type of grain in any given lot.

The price for rough rice of the 1948-49 crop was fixed by the Government at about $1.75 per bushel or $6.30 per barrel delivered at the local railway station. Deductions are made in the base price for rice delivered to the mills if it contains more than 18 percent moisture or more than 6 percent bad rice, red rice, weed seeds, and other impurities.

By Government order, the mills produce and market only two grades of rice, "common" and "extra fine." The "common" has a permitted tolerance of broken grains up to 35 percent while the "extra fine" does not exceed 10 percent brokens. The fixed prices were the equivalent of a wholesale price of $8.00 per 100 pounds for "common" and $11.00 per 100 for "extra fine," and the retail prices were 9 and 14 cents per pound, respectively.

Practically all of the rice production is financed by 20 large milling companies. These mills advance seed to the growers, and lend them money for producing the crop to the extent of from $25 to $30 per acre. They employ field men to supervise the use of their money in growing rice and to see that the harvest moves to the mills. These millers point out that the current domestic price of rice is now slightly above the world price and that, with increasing costs and lower yields per acre, Chile is unlikely to regain its export position as long as these circumstances prevail.

The per capita consumption of rice in both Chile and Peru is around 20 pounds per year. Annual consumption therefore is about 110 million pounds of milled rice. This is the equivalent of about 3,900,000 bushels of rough rice, including annual seed requirements. Rice and beans are reported to be the major items in the diet of low income families, and the two foods tend to interchange or to compete, depending on relative prices. The established price for rice of the "common" type in June 1949 was somewhat above the comparable price for beans; if this should continue, the per capita consumption of rice might decline. Over a period of years, however, the per capita consumption of rice is not expected to decrease as the cost of bean production is likely to rise and fall with the cost of rice production.

Chile has water and land to maintain a production level on a reasonably efficient basis. Although the average yields per acre have declined, they are higher than in the United States. Climatic conditions, however, restrict production to medium- and short-grain types, and certain weed control and other production problems are yet to be solved. In addition to this, other crops compete for the same land and water.

The above factors indicate that there will be little rice exported from Chile in the next few years. Fluctuations in prices of competing crops and new developments in the production methods of Chile could change this situation.

Peru

Peru probably will not be a market for a large quantity of United States rice in the near future. It will produce domestic needs except in years when water supplies are low. In this event a lack of foreign exchange is likely to reduce consumption. If any imports are arranged, they probably will consist of relatively small quantities from Ecuador. Peru could become an exporter, but

this does not appear likely in the near future. Much of 320,000 acres now planted in cotton and 125,000 acres in sugar cane could be shifted to rice. If the price of cotton and sugar were to decline, a change-over to rice as an export crop could develop.

Table 2. PERU: Rice acreage and production, averages 1920-24 to 1940-44, annual 1945-49

Year	Seeded acreage	Yield per acre	Production 1/	
			Rough	In terms of milled
	1,000 acres	Bushels	1,000 bushels	1,000 pounds
Average				
1920-24	77	32.1	2,474	72,311
1925-29	82	28.4	2,332	68,122
1930-34	125	38.2	4,781	139,772
1935-39	106	38.0	4,027	117,726
1940-44	131	49.3	6,452	188,493
Annual				
1945	147	53.1	7,810	230,775
1946	126	74.7	9,409	278,432
1947	114	63.7	7,261	217,839
1948	132	76.8	10,132	303,964
1949 2/	94	68.3	6,423	192,682

1/ Does not include 5 percent of the crop used for seed.
2/ Preliminary.

Source: Office of Agricultural Attache, American Embassy, Lima, SCIPA, and other sources.

The data in table 2 indicate that unlike the situation in Chile, rice has been an important crop in Peru for at least 30 years. While the planted acreage increased about 70 percent from the 1920-24 to the 1940-44 period, in recent years it has been fairly stable or near the 1940-44 average of 130,000 acres. Trends in yields, however, have been spectacular. Whereas the per acre yields in Chile declined, in Peru they increased markedly. The yield in 1920-24 was about 34 bushels, or 9 barrels, per acre. It increased steadily until in the 1940-44 period it averaged 50 bushels, or 14 barrels, and in the 1945-49 period, more than 65 bushels, or 18 barrels, per acre.

The reasons for this increase in the yields per acre appear to be related to the importance of the crop. Rice has become a source of cash income on farms in some of the coastal areas of Peru and changes in production practices have accompanied the shift from rice as a minor food to a major cash crop. Whereas, formerly rice was produced in small plots under relatively primitive conditions, it now is cultivated in large areas with the same attention as cotton and sugar. An important change accompanying the increase in rice acreage was the shift away from broadcasting to hand-transplanting methods. Less than half of the crop in prewar years was transplanted, but in recent years at least 85 percent has been produced in this manner. The proportion varies from year to year, depending on the time that water becomes available. In the 1949 planting season, water for irrigation became available so late that a larger part than usual was seeded by direct broadcasting. In the leading rice area of Peru, the Department of Lambayeque, about 20 percent of the 45,000 acres planted to rice was broadcasted directly and 80 percent was transplanted. This ratio was reported to be about the same in the other valleys.

Other important factors in the increase of per acre yields are: (1) an efficient use of available water supply by the construction of levees on the contour rather than in small, rectangular plots, (2) greater efficiency in plowing and fitting operations with the use of tractors, (3) an increased use of fertilizer, and (4) better harvesting methods, including the use of the threshing machine in place of threshing by hand and with the use of oxen. Although cut by hand, about 70 percent of the crop is now being threshed in modern machinery.

Table 3. PERU: Milled rice consumption in selected years, 1917 to 1947

Year	Disappearance	Population	Per capita
	1,000 pounds	Million	Pounds
1917.....	95,029	4.2	23
1921.....	103,396	4.5	23
1925.....	125,479	4.8	26
1929.....	154,558	5.1	31
1933.....	115,779	5.5	22
1937.....	113,707	5.9	20
1939.....	173,914	6.1	29
1941.....	229,979	6.3	36
1943.....	179,591	6.6	27
1945.....	259,041	6.8	38
1947.....	217,841	7.1	31

Source: Office of Agricultural Attache, American Embassy, Lima, SCIPA, and other sources.

Data show that Peru's per capita consumption of milled rice has been from 20 to 25 pounds annually during most of the last 30 years (Table 3). The small variation from year to year indicates that this rate is likely to continue if supplies are available. The annual consumption of milled rice is estimated at about 243 million pounds. Domestic production in 1948 was sufficient to meet this need.

Table 4. PERU: Rice (milled) imports in selected years, 1937 to 1947

Source	1937	1939	1941	1943	1945	1947
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1.000 pounds	1,000 pounds
Brazil....	280	990	6,339	1,382	710	1/
China.....	997	45	9	0	0	0
Ecuador...	576	9,734	1,379	3,336	15,954	1/
United States.	112	220	4	0	0	1/
Hong Kong.	4,926	14	0	0	0	0
India.....	815	333	0	0	0	0
Japan.....	43	51	8	0	0	0
Siam.....	14,763	34,745	0	0	0	0
Chile.....	0	44	51	0	11,601	0
Others....	320	65	0	0	0	0
Total..	22,832	46,241	7,790	4,718	28,265	1/

1/ Less than 500 pounds.

Source: Office of Agricultural Attache, American Embassy, Lima, SCIPA, and other sources.

Both Peru and Chile imported fairly large quantities of rice in some years of the prewar period. Peru's milled rice imports amounted to about 22 million pounds in 1937 and to 46 million pounds in 1939, but declined during the war when supplies were difficult to obtain (Table 4). Imports in 1945, however, amounted to about 29 million pounds, largely because of low domestic production the previous year. Imports have come from a number of sources, with Siam the principal supplier before the war and Ecuador in 1945.

A shortage of rice similar to that which developed in 1945 may be in prospect for Peru in late 1949 and early 1950. A recent unofficial estimate places the 1949 plantings at 94,000 acres and the crop at 6,400,000 bushels of rough rice (190 million pounds in terms of milled). This is 55 million pounds of milled rice less than the normal consumption requirement of 245 million pounds. This means Peru will have to import additional supplies in 1949-50 to reduce consumption to about three-fourths of average. In view of the wide difference between the domestic price of rice and the prospective price of imported supplies, it would appear doubtful if the country will import rice.

Rough rice prices for the 1949 crop were announed on May 20, 1949, for the major part of the crop harvested and threshed from May to September. These are authorized to be paid by agencies representing the Government. The basic price was set at 83 cents per bushel, or $3.00 per barrel.

Rough rice is delivered to mills by a Government purchasing agency and the miller usually mills it for the Government on a toll basis. The Government pays the miller the equivalent of 8 cents per 100 pounds of the rice milled, including all broken rice. All by-products become the property of the miller. The miller must, however, sell to the producer the equivalent of 3 percent of the rough rice weight in rice bran at a fixed price of 53 cents per 100 pounds. In addition, the miller must mill a fixed percentage of the milled product for each unit of rough rice delivered to him. This varies from 57 percent in the southern area, where rough rice is considered to have a poorer milling quality, to 66 percent in the important northern region.

Two grades are being produced: "Corriente," containing not more than 35 percent broken grains; and "Extra," containing not more than 25 percent brokens. Most of the milled product is of the "Corriente" grade, since to mill this grade, the miller has only to run the rice through a huller and polisher, and then sack it, without having to separate and remix it. Average milling percentages in the southern Cámana area are reported to be 63 percent salable rice of the "Corriente" grade, 1 percent small brokens, and 7 percent bran. In the more important Chiclayo area, they are reported to be about 66 percent "Corriente" grade milled rice, 1 percent brokens, and 6 percent bran.

The miller is required to deliver the 1949 crop to designated wholesale purchasers who pay fixed prices. These prices permit a small margin. Wholesalers are then required to sell at a retail price of about $2\frac{1}{2}$ cents a pound for the "Corriente" grade and 3 cents a pound for the "Extra."

Peru's rice is produced largely in the northern valleys along the seacoast. Production is centered in the region of Pacasmayo, Chiclayo, and Piura which produce about 85 percent of the total crop. Here the seeding usually is in December and January, and transplanting is in January and February. The crop is cut and stacked in June and July, and threshing continues from late June to early September. Since the region has no rainfall, the timing of the crop depends upon when the water supply becomes available from the rains and snow from the Andes mountains.

About 10 percent of the crop is produced in the Department of Arequipa, which is near the southern border of Peru. In this region the crop is about three months earlier; it is seeded in October and November, transplanted in November and December, and harvested in May. The remainder is produced in small valleys along the coast with the exception of a small amount of jungle rice east of the Andes and some dryland rice in the foothills. The total area of these types is estimated to be only 1,200 acres, or less than 1 percent of the normal acreage.

As indicated previously, about 85 percent of the crop is transplanted and 15 percent broadcasted directly. In the major area of the north about 600 pounds of seed rice per acre usually are planted in the nursery bed. One

acre of seedlings from the nursery produces enough plants to transplant nearly 5 acres in the field. This means a seed requirement of 125 pounds (2.8 bushels) per acre when transplanting. The plants are set with about three plants per hill with a distance of 6 inches between hills. In broadcasting, about 120 pounds (2.9 bushels) of seed per acre is used.

There are no established crop rotations. Rice usually is planted on the same fields from year to year, as in Chile, and if water is sufficient the field is plowed after the rice has been harvested and a crop of beans or corn is grown in the dry season. High yields per acre are aided, however, by a relatively heavy application of fertilizer. The native Peruvian "guano" is the fertilizer used most frequently, and an average of 450 pounds per acre is applied. In addition, some nitrate of soda is used in top-dressing and some producers are now using ammonium sulphate in the irrigation water just after planting or transplanting.

Water usually is held on the growing rice constantly until just before harvest. The crop is hand-weeded and occasionally must be guarded against bird damage during the growing season. The varieties grown are mostly the medium-grain type, similar to our Early Prolific and Blue Rose, and they have a growing season of from 120 to 150 days.

The crop in the largest rice area is cut by hand, and the stalks are bundled and hauled by hand or on burro to a central location in the field. Then they are piled in large cylindrical or square stacks which sometimes are 50 feet across and as high as 12 to 15 feet. Since it never rains in the eastern area, threshing is more leisurely done than in most countries. The rice is threshed as threshing machines become available and the operation continues over a period of three months.

Although about 70 percent of the crop is threshed with machinery, on the fringes of the northern area and in the southern area the crop is threshed mostly by hand. Here the crop is cut and hauled immediately to a level, clear spot in the field where it is threshed. The rough rice is beaten with a stick or tramped by horses or oxen on a circular "threshing floor." Rice threshed by this method is usually too wet to store safely and the mills have open-air floors where the rice is spread and exposed to dry in the sun for several days. It is turned each day until the moisture content is reduced to a reasonably satisfactory level.

The most unusual feature of Peru's rice production is the large part of the crop which is transplanted and the trend in recent years towards more transplanting. This is contrary to that in Chile and other countries and Peru is the only one in South America where a large part of the crop is produced in this way. Experienced observers in Peru attribute this practice to three important factors: (1) the population in the coastal valleys of Peru is relatively dense. On the other hand, good land with water for irrigation is scarce. Since hand-transplanted rice produces considerably higher yields per acre than broadcasted rice, it has become general in this area; (2) a proportion of the crop is grown on highly alkaline soils on which it will not develop unless the water supply is abundant all of the time. On the soils of these areas rice

is transplanted because it will not develop when broadcasted; (3) the time that the water flow from the mountains becomes available lacks uniformity from year to year. There may be as much as three months difference from season to season. Thus, by starting the crop in the relatively small nursery plots which require only a small amount of water in comparison to that needed if all the fields were broadcast, the crop can be grown for one to two months in the nursery and transplanted immediately in the fields as soon as the water becomes available. In this respect, the Peruvian practice differs from that in Japan and China where it is believed the crop must be transplanted on the 41st day after it was seeded.

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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Ecuador 1/

Rice exports from Ecuador during the next 3 to 5 years probably will be between 100 and 150 million pounds annually, varying somewhat with weather conditions. The coastal region is a relatively productive area; the climate is ideal in many respects for rice growing, and there is sufficient land to allow an increase in production and export levels. Expansion of Ecuador's output, however, is not expected to occur in the near future. Current production levels appear to be utilizing fully the present labor resources and, because of certain geographic disadvantages, mechanization will come slowly. Thus, the indications are that Ecuador, following some price and wage-rate adjustments, will continue to produce about the same quantity of rice for export markets.

Rice produced for export is long-grain, and is of fairly good quality. Although it is advantageous for exporters to develop nearby markets to save shipping costs, they will sell to any area offering dollar exchange in payment. They expect their primary markets to be Venezuela and Cuba, since these countries want long-grain rice and have the dollar exchange to pay for it. Their secondary market eventually is likely to be the Philippine Republic because of the availability of dollar exchange in that country. Thus for the next 3 to 5 years, United States producers of long-grain rice can expect some competition from Ecuador in Venezuela, Cuba, and the Philippines.

Ecuador's production more than doubled between 1941 and 1948 and total exports increased about three times. This expansion appears to have begun during the 1930-34 depression, when production costs dropped more than selling prices. At about the same time plant diseases in Ecuador's important cacao crop started a downward trend in production of that crop and farmers turned more and more to rice cultivation. By 1945 the income from rice exports was greater than that from any other agricultural product, and was exceeded only by that from "Panama" hats. Since 1945, rice has been the most important source of foreign exchange for Ecuador and has made up more than one-third of the total earned from all sources.

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

Annual surveys or official estimates showing Ecuador's rice acreage are not available. According to the most reliable estimates, it appears that there were about 90,000 acres harvested from 1940 to 1942; about 150,000 acres in the next 3 years, and from 1945 to 1949 the acreage increased to a relatively stable level of about 180,000 acres. The current estimate of the 1949 rice acreage, including both crops, is about 180,000 acres. The large harvest in 1949 is due to relatively favorable weather, with the rains starting and stopping at the right time (Table 1). This was in marked contrast with the below-average climatic conditions which prevailed in 1948. The production and estimated acreage figures give an average yield per acre of 45 bushels, or about 12½ barrels, in 1949, compared with 37 bushels, or about 10 barrels, in 1948.

Table 1. ECUADOR: Rice production, exports, and domestic disappearance, 1940-49

Year	Production		Exports	Domestic disappearance 1/
	Rough	In terms of milled		
	1,000 bushels	Million pounds	Million pounds	Million pounds
1940	3,026	89	40	49
1941	4,265	125	45	80
1942	5,718	167	71	96
1943	7,607	223	104	119
1944	6,075	178	142	36
1945	4,577	134	65	69
1946	7,691	225	148	77
1947	8,494	248	139	109
1948	6,596	193	139	54
1949 2/	8,150	238	-	-

1/ Not adjusted for differences in carry-over from year to year as inventory data for most years are not available. The annual consumption for the country as a whole from 1945 to 1948 is estimated to be from 75 to 100 million pounds of milled rice.

2/ Preliminary.

Compiled from official statistics.

Trade sources estimate that export supplies in 1949 will amount to approximately 150 million pounds of milled rice. If the production is as large as expected, these export supplies will exceed the previous record exports of 1946 (Table 2).

Table 2. ECUADOR: Rice (milled) exports by country of destination, calendar years 1946-48.

Country	1946	1947	1948
	1,000 pounds	1,000 pounds	1,000 pounds
Philippines	38,126	0	45,260
Cuba	45,517	11,573	25,037
Indonesia	4,367	0	15,170
Venezuela	17,413	49,380	11,952
Peru	0	0	9,582
Panama	4,931	3,571	6,743
Dominican Republic	0	4,525	4,574
Colombia	2,011	12,529	2,494
French West Indies	4,195	0	0
Greece	5,283	993	144
Jamaica	16,253	7,238	0
Mexico	5,528	2,034	0
India	0	38,092	0
Others	3,904	8,912	17,897
Total	147,528	138,847	138,853

Compiled from official sources.

Marketing practices:

Three principal types of rice are produced in Ecuador. The most important is "Canilla," a medium-long, slender grain which is accepted in most of the export markets as a long-grain although it is slightly smaller than most of the long-grain varieties. This type comprises about 65 percent of the total production and is produced primarily for export. It predominates because it yields a higher volume of milled rice under local production methods and mills into a white, clean product with a relatively low percentage of broken grains. Canilla has one disadvantage, however, in that it lodges more than any other variety. With hand-harvesting as practiced in Ecuador this does not present a serious problem. Because of lodging, however, this type is not adapted to mechanized production. Millers report that, as the result of the small size of "Canilla" grains, the milling capacity is reduced from 10 to 20 percent in comparison with other types.

The second type, "Fortuna," accounts for about 30 percent of the total crop. This is the preferred rice for domestic consumption and brings a slight premium on local markets. The grain is as long as Canilla but is about twice as wide. The third type is a combination of several medium-grains, the most important of which is "Chato," which looks something like the Prolific variety.

Reference is made to types rather than varieties as there appear to be few if any pure-line rice varieties in Ecuador. The Canilla is reported originally to be of the Rexora variety. Although it has growing season requirements similar to Rexora, it is slightly smaller, has a deeper orange color, and looks like some of the "fine" rices of India. The grains are not uniform in size or shape. The Fortuna is named after the seed obtained originally from the United States, but it, too, has been well mixed with other types, including some of the Siam varieties and Nira and Lady Wright from the United States. It, therefore, shows a wide variation in size of grain. The medium-grain types apparently came from Argentina, Brazil and the United States, and several varieties usually can be identified in any given lot.

Most of Ecuador's rice is produced on small, tenant-operated farms, with the average planted area estimated at about 7 acres. These farms are financed by the mills or land-owners. Most of the loans are made payable in a given amount of rice to be delivered to the lender during the harvest season. The grower delivers rice in small lots to the mills where it is graded and sorted according to variety, moisture content, and impurities. He is credited with deliveries until all his loans have been paid, and then he is issued certificates for the remainder of the crop which he can sell to the highest bidder. Grading is mostly by hand sampling and visual observations.

The producer is paid for rough rice on the basis of 100 pounds of milled, and all statistics regarding rice are in terms of its equivalent in milled rice. Government regulations provide that the mills pay for the Fortuna or Chaco types on the basis of 175 pounds of rough rice per 100 pound milled rice credit. The Canilla type is paid for on the basis of 165 pounds of rough rice per 100-pound milled rice credit on a "dry and clean" basis, with the miller permitted to require up to 190 pounds of rough rice per 100-pound milled rice credit if the rough rice has impurities or a high moisture content. Since determinations of these factors are visual and are only approximate, the miller requires delivery of a little more rough rice than will be needed to obtain 100 pounds of milled so as to be on the safe side. This "overrun" usually is reported to average about 10 percent.

When the miller has dried the rice sufficiently for reasonably good storage, he reports to the control authorities of the Government the quantity and type received. These reports are required at 15-day intervals during the season and are audited by Government inspectors. After the rough rice is stored, the miller either sells it to the Government at the support price or mills it. Because of the uncertainty of export prices in 1949, the rough rice usually has been sold to the Government. Although it is sold immediately, it remains in the millers' warehouses. Millers are required to keep it in reasonably good condition for 3 months free of charge, and are paid a small storage fee thereafter. The rough rice is milled only by Government order when it has been sold to an exporter or domestic dealer.

Another unusual feature in the rice marketing in Ecuador is the type of storage. Practically all rice is stored as bulk rough rice in flat warehouses. These are large, 2- to 4-story bamboo structures with open sections for ventilation near the top of the wall on each floor. Storage is arranged according

to variety and impurities, and rice is dried on open-air, concrete drying floors. It is dumped on the floors, spread out evenly and stirred by walking over it barefoot. Then it is heaped up, with the piles being made larger as the rice dries, and each night it is covered with canvas to prevent dampening from dew. This process is repeated daily for about a week. When sufficiently dry to store, it is sacked, hauled into the low, flat warehouses, and dumped on the floor. Government regulations require that rough rice cannot be stored in warehouses at a depth of more than 59 inches, except under unusual circumstances, when a depth of 79 inches is allowed. For about a month after entering the warehouses, the rough rice is turned daily by workers who use hand shovels, starting at one end of the warehouse and working toward the other end. After the first month, occasional turnings at less frequent intervals are required until the rice is milled.

There were two mechanical dryers in Ecuador, and these were used for only part of the rough rice delivered at the two mills which operate them. One miller using moisture-testing equipment reported that rough rice usually comes in at the beginning of the season with at from 25 to 28 percent moisture, but by the end of the season, the moisture content has dropped to about 18 percent. The open-air drying method used by most mills is possible because of little rainfall in late June and July. Under this method, however, "stack-burning" and discoloration are likely to occur after about 3 months.

One miller in the interior visited by Dr. Efferson follows the practice of trying to heat the rough rice in order to produce stack-burn and discoloration. The milled result is a "yellow" rice which has a ready sale in some areas. This relatively low-quality rice appears to have been sold in the interior mountain areas where consumers have developed a preference for it.

Reliable data on percentages of products milled from rough rice were difficult to obtain. Although much variation was reported from mill to mill, the following appear to represent the percentages under ordinary milling conditions:

Percentage of rice products obtained per unit of fairly clean rough rice with 15 percent moisture content

Product	Canilla	Fortuna
	Percent	Percent
Whole milled rice 1/....	64.52	66.67
Broken rice.....	1.94	1.34
Rice polish.....	3.87	2.66
Rice bran.....	7.74	7.33
Hulls and waste.....	21.93	22.00
	100.00	100.00

1/ Includes an average of from 15 to 20 percent broken grains.

Whole grains generally are not separated from the brokens and then re-mixed according to definite specifications. Only the very fine brokens are separated and sacked, and the remainder is one product, "whole milled rice." To produce milled rice with broken percentages, rice is selected which will produce the desired product without separation.

Sixty-eight "public" mills and 44 "private" mills reportedly are in operation in Ecuador during the current milling season. Public mills are licensed to mill for their own account and for the public, are permitted to issue warehouse receipts for all rice received, and are subject to strict government control. Private mills are small units, operated by some large producers only for their own production, and are not subject to many of the Government regulations.

Under the toll-milling of government-owned rice, which represents about 80 percent of the current crop, millers are allowed certain fixed fees for milling and they maintain control of the by-products. By Government regulation, there are three principal grades of rice milled: No. 1, a white rice, with no more than 3 percent stained, and up to 25 percent broken grains; No. 2, a cream-colored product, with no more than 8 percent stained, and up to 30 percent broken grains; and No. 3, a yellow (stack-burned) rice with up to 30 percent broken grains. The toll-milling fee allowed for producing any of these for domestic consumption is about 60 cents per 100 pounds of milled rice.

The toll-milling fees are higher for the milling of better-quality rice for export. The export quality rice is all of the No. 1 and is divided into four classes. For class 1, which has a broken tolerance of 10 percent or less, the toll-milling fee is equivalent to $1.14 per 100 pounds of milled rice. For class 2, with a broken tolerance of from 10 to 14 percent, the fee is $1.07. For class 3, with a broken tolerance of from 15 to 20 percent, the fee is 92 cents; and for class 4, with a broken tolerance of from 21 to 25 percent, the fee is 77 cents per 100 pounds. Exporters report that most of the sales in recent years have been of class 3. Since these fees range from 75 cents per 100 pounds for class 4 to $1.14 per 100 pounds for class 1, they are all higher than the milling fee for rice consumed domestically. Accordingly, most of the millers prefer to mill rice for export. Once the rice stored in their warehouses is sold to the Government, however, they must mill according to Government regulations. For this reason some of the millers finance their own rice for export rather than take a chance on accepting a lower milling-toll for rice consumed domestically.

The Government-controlled prices of rice at retail in effect during July 1949 were about 6 cents per pound for common, and 7 cents per pound for choice rice.

Production practices:

There are two major and one minor rice crops harvested in Ecuador annually. The most important, the "invierno," or winter crop, is seeded late in December and January at the beginning of the rainy season and is harvested late in May and through June and early July, immediately after the end of the rainy season. This crop makes up about 80 percent of the total annual production. In August the minor crop, the "soca", which makes up about 5 percent of the total

production is harvested. This crop grows entirely from the offshoots from the May-July harvest stubble. The second most important is the "vega" or summer crop, which is planted in June and harvested in late September and October, and comprises some 15 percent of the total.

Short-grain varieties from Italy and the United States have been tried from time to time and producers report they obtain unusually high yields per unit of land area planted, but that the price is so low in relation to prices for Canilla and Fortuna that this short-grain rice is not profitable.

The principal crop is planted on land which has been idle for one or two years and has grown up to weeds and brush from 6 to 10 feet high. The hand-knife, or machete, is the only implement used by most of the farmers when growing and harvesting the crop. Near the end of the dry season before the December planting, the vegetation is cut with the machete and burned. When the rains begin, small holes are dug about 10 to 12 inches apart in the burned-over soil, and 3 to 4 rice seeds are dropped in each hole. Thus the fields are prepared and planted. Although most of the land has no terraces, drains, or means of artificial irrigation, the fairly flat fields lying between low-lying hills or higher sloping land act as natural water reservoirs which collect and hold the water until the end of the rainy season. An average of 3 hand-weedings a year, about one month apart, is usual, with the weeds cut down with a machete.

The planting is timed so that the crop receives the full benefit of the rainfall during the rainy season. Average rainfall records for the rice area of Ecuador are as follows:

ECUADOR: Average rainfall by month for an average 25-year period

Month	Volume	Month	Volume	Month	Volume
	Inches		Inches		Inches
January...	15.20	May.....	3.47	September.	0.11
February..	19.73	June.....	0.57	October...	0.28
March.....	18.13	July.....	0.01	November..	0.27
April.....	11.58	August...	0.03	December..	2.38

After a small area has been cut with a machete or hand-scythe, a sheet of canvas is spread on the stubble field nearby where the rice is threshed. A small bundle of the cut stalks is picked up and the heads are beaten onto the canvas. It usually takes only one stroke to shatter out all of the grain of the Canilla variety from a bundle of 20 to 40 stalks. After threshing, the grain is raked up, sacked, and carried by hand or donkey to a nearby stream where it is placed on the bank to await a buyer. Because the heavy rainy season usually washes out the roads, most transportation at harvest-time is by water. Rice buyers who are representatives of different mills move

up and down the streams, bargain for the crop, and furnish the sacks in which the rough rice is transferred to the boats. It is then transported to the mills to be dried and processed.

While some mechanization is in progress, the mechanized production under controlled irrigation does not make up more than 1 to 2 percent of the total area planted to rice. Rice is not grown on one uniform, flat stretch of land. Rather, it is grown on a large number of fairly small, widely separated and somewhat rolling fertile lowland areas, with rugged hills and many streams in between. During the rainy season, it is often impossible to move a tractor from one field to another and transportation by any other means than by water is impossible. The fields, although fairly level, are not suitable for terracing and artificial irrigation without extensive improvements. As weeds present a major production problem, it is hoped to eliminate hand weeding by irrigation and planting in water. Some harvesting with the use of combines is also planned. Rather complete mechanization can and may take place over a 20- to 30-year period.

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FOREIGN MARKET NOTES--RICE

J. N. Efferson Reports on the Rice Situation in Cuba and Panama 1/

Cuba in recent years has become the most important foreign outlet for United States rice. It imports from us about four times the volume it did before the war and takes about one-fourth of our total production. Practically all of the rice imports into Cuba during the first 6 months of 1949 came from the United States. Approximately 610 million pounds of the 620 million pounds imported in 1947 were from this country. In contrast before the war Cuba obtained about twice as much rice from Siam as from the United States and imported large quantities from Burma and French Indochina as well.

Table 1. - CUBA: Rice (in terms of milled) imports by country of origin, for selected periods, 1934-48

Country of origin	1934-38	1939-43	1944-48	1939-48	
	Million pounds	Million pounds	Million pounds	Million pounds	Percent of total
United States	83	287	395	341	78.1
Ecuador	0	24	43	34	7.7
Siam	220	54	0	27	6.2
French Indochina	30	21	0	10	2.4
British India and Burma	103	8	0	4	0.9
Chile	0	8	5	7	1.5
Mexico	0	6	4	5	1.1
Brazil	0	0	1	1	0.1
Other countries	6	3	14	7	2.0
Total	442	411	462	436	100.0

Compiled from official sources.

Cuba's rice imports from all countries in the 1948-49 marketing season approximated 450 million pounds. This was 120 million pounds

1/ Preliminary report of a study of foreign market outlets for and competition with United States rice conducted under the provisions of the Research and Marketing Act.

less than in the preceding year but somewhat higher than the prewar average (1935-36/39-40) of around 420 million pounds. Total arrivals during the first 6 months of 1949 amounted to about 230 million pounds.

Table 2. - CUBA: Rice (in terms of milled) imports by month, August-July, 1943-44 to 1947-48

Month	1943-44	1944-45	1945-46	1946-47	1947-48
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
August.....	27	28	16	17	13
September..	29	42	34	6	35
October....	62	48	55	18	103
November...	30	61	39	29	96
December...	34	38	59	55	96
January....	36	48	48	43	16
February...	35	39	39	30	5
March.....	44	33	31	75	34
April.....	33	21	34	77	26
May.....	26	24	19	44	94
June.....	19	15	20	55	40
July.....	46	22	34	22	13
Total...	421	419	428	471	571

Compiled from official statistics.

The annual consumption of milled rice is now estimated at about 580 million pounds. According to recent Government data used in connection with rice import-quota determinations, the 1948 domestic production of milled rice amounted to 130 million pounds. Subtracting production from 1949 estimated needs, the indicated import requirements for 1949 are 450 million pounds. Cuba probably will continue to require from 400 to 500 million pounds of milled rice imports for the next few years.

Rice imports into Cuba from the United States in the near future, however, are likely to be conditioned by provisions of the General Agreement on Tariffs and Trade (GATT), which was negotiated in 1947 and became effective in 1948. This agreement permitted Cuba to establish an import quota of 330 million pounds on milled rice with additional quantities above this volume to be imported at double the import duty rates. Provisions of the agreement permit the Cuban Government to establish an over-all quota, with or without individual country allocations, as the Government deems desirable. Thus far in 1949, individual country allotments have not been established. If and when such an allocation is set, the shares allocated would be in proportion to the imports from importing countries during the 10 calendar years immediately preceding the first year in which allocation is made. In this event, the proportion of imports from the United States in 1949 would be 78 percent of the 330-million-pound quota (see Table 1).

Another measure designed to aid Cuban producers was a resolution by the Cuban Government on April 12 which ordered customs officials to collect a full 6 percent sales tax on all imported rice, with the accrual placed in a general fund of the Treasury. This sales tax has the effect of an additional tariff charge averaging 83 cents per 100 pounds, thereby affecting the advantages of the GATT agreement. The application of the GATT provisions and Cuba's local taxes should be watched by American exporters in order to keep abreast of the picture there.

The Cuban rice market is one of the most quality-conscious in the world. Most of the consumers pay high prices for high-quality, long-grain rice, and they buy second-quality only if the best is not available. This preference appears to be due to methods of cooking and eating rice. The per-capita consumption is nearly 100 pounds annually. This is consumed mostly as boiled white rice served separately and not used with gravies, beans, other foods, or seasonings. Consumers appear to have concluded that only the United States Rexora and Bluebonnet type meets these requirements. The 100 percent brokens of the United States Rexora and Bluebonnet variety move faster at a higher price in the retail markets than 4 percent brokens, well-milled Zenith or other similar medium and short-grain types. The brokers, wholesalers, retailers, and consumers commented generally that if the United States rice industry wants to maintain the Cuban market, they should ship more Rexora and Bluebonnet and less Zenith, Early Prolific, and Pearl types.

The general opinion is that the preference for the Rexora type will continue as long as Cuba has reasonable prosperity and sufficient buying power to purchase the type they prefer. In the event of a decline in buying power, however, consumers probably will revert to the prewar depression habit of buying the greatest volume for the money regardless of quality. Dealers report that there will always be a small demand in Cuba for low-grade, short-grain rice to supply low-income consumers. This demand, as long as sugar prices remain fairly high, will be restricted to small lots totalling 10 percent or less of gross imports. The preferred type of this rice is Early Prolific rather than Blue Rose or Zenith.

There is practically no demand for packaged rice. The consumer usually purchases rice only after careful examination and is skeptical as to the quality of packaged rice if he cannot open it to examine the contents. One large mill in Havana visited by Dr. Efferson in July 1949 had eight men opening up two-pound packages of high-grade, Rexora-type rice and placing into sacks before moving to the wholesale trade. The United States rice mill which sold this could have obtained just as good a price for the product in 100-pound sacks as in its small, expensive containers. There is no demand for parboiled rice. Some parboiled rice sent from the United States to Cuba in 1946 is still in the warehouse of the purchaser.

Rice production:

Cuba's 1948 planted acreage is estimated at about 133,000 acres, the harvested acreage at 123,000 acres, and the average yield per acre at 24.4 bushels of rough rice. This gives a production of 3,000,000 bushels of rough

rice, or the equivalent of about 88 million pounds milled. The crop available for consumption in 1949, allowing for seed, is about 80 million pounds, or approximately 14 percent of consumption requirements. Preliminary estimates of the 1949 crop are: planted area, 130,000 acres; harvested acreage, assuming normal weather conditions, about 120,000 acres; and production, 2,890,000 bushels, or slightly less than the record of 1948.

In the prewar (1935-39) period, acreage averaged only 45,000 acres annually and production, 967,000 bushels of rough rice. The 1948 crop was about three times as great as before the war. The acreage expanded during the war years because of an extreme shortage of rice and resulting high prices. From 1944 to 1946 retail prices on the black market rose as high as 30 to 40 cents per pound.

Most Cuban observers believe that production has reached its peak and that current levels will be difficult to maintain. There reportedly are several basic factors which may prevent an expansion materally above current levels and even cause a decline in production. Heavy weed growth throughout the year is the major problem. In most areas land can be cleared of brush and planted a year or two with good results but after that the occurrence of weeds reduces the yields per acre below economical levels.

Another problem is the production of a variety which will meet consumer preference and will also produce high yields under local climatic and soil conditions. That variety so far has not been found. The Honduras variety is planted on about 90 percent of Cuba's rice acreage, as it produces the largest per acre yields. Although this is a long-grain rice, it is not so much in demand as Rexora. One dealer reported that the sale of Honduras at $9.00 per 100 pounds wholesale was difficult, while at the same time imported Rexora was moving readily at $12.00 per 100 pounds. Honduras has another disadvantage in that it lodges badly. Numerous trials with different types of machinery therefore have met with little success in harvesting by mechanical means. In spite of these disadvantages, however, producers report that Honduras will continue to be the principal variety grown because it is the best adapted to the local climate and soils.

Still another factor which retards rice growing is a lack of sufficient water for irrigation. Some producers recently have drilled deep wells where there are shallow ground-water resources. If rice prices remain at relatively high levels, more development in this direction can be expected.

The six provinces leading in rice production are Matanzas, Las Villas, Pinar del Rio, Habana, Oriente, and Camabuey. Approximately 60 percent of the crop is produced in relatively large units, where production is mechanized. Farms are fitted with tractor plows and grain drills for planting and are diked to hold rain water, although in some cases additional water is pumped into the fields. Harvesting in many instances is mechanized. Because of lodging the usual harvesting method is to cut the crop with a large mowing machine with a swather attachment, wind-row the crop, let it dry on the stubble for several days, and then move down the wind row with a combine, using a pick-up reel to thresh the crop.

About 40 percent of production is upland rice, produced on rolling land in small acreages ranging from one-tenth to one-half an acre. Land is plowed with oxen or is freshly-cleared and burned where plowing is not needed.

Most of the rice is planted in April, May, and June, and harvested in September and October because of limited water supplies. The crop is timed according to the rainy season which begins in May and extends through October. Most of the land is semi-irrigated. The Cuban agricultural census of 1945 indicated that out of 28,800 rice farms only 1.4 percent had irrigating equipment, but that 10.8 percent of the total seeded acreage was irrigated. These data also show that fertilizer was used on 1 percent of the rice farms and on 4.9 percent of the total seeded acreage. There appears to be little or no standard crop rotation with rice.

Panama

Panama apparently will not be an important market for milled rice in the next few years. There is a possibility, however, of developing a limited but possibly highly profitable market for good quality seed rice in that country. This applies also in several other rice-producing countries of Latin America. Very little rice has been imported into Panama so far in 1949. Most observers estimate that imports of about 6 million pounds of milled rice will be needed from August through October just before the first part of the 1949 crops come on the market.

On a per-capita basis, Panama has been one of the largest rice consumers in Latin America. The average consumption per person is about 150 pounds annually - 50 percent higher than Cuba. In 1948, with a population of 746,400, the country consumed 118 million pounds of milled rice. Of this volume, 106 million pounds was from domestic production and 12 million was exported. During the last 10 years, Panama has produced from 80 to 90 percent and has imported from 10 to 20 percent of total requirements. The 1948 imports came from El Salvador, Nicaragua, and Ecuador. In previous years, rice was imported from a number of countries in Latin America and North America, including small quantities from the United States.

Panama may be self-sufficient in rice in a year or so if output continues to increase at its present rate. Production has increased gradually since the beginning of World War II. If the 1949 harvest is as large as expected it will reach 4,060,000 bushels of rough rice, or 119 million pounds of milled rice. This would approximate 1950 requirements.

Although Panama may soon become self-sufficient in rice, it appears that it is not likely to expand production to the point of exporting significant quantities. The current expansion program has resulted from both direct and indirect subsidies. These probably will be continued, but the present high price guaranteed by the Government indicates that the cost of production is too high to permit free competition at current world prices.

Table 3. - PANAMA: Rice acreage, production, imports, and price, 1941-49

Year	Planted acreage	Production: Rough	Production: In terms of milled	Imports	Average import price
	1,000 acres	1,000 bushels	1,000 pounds	1,000 pounds	Cents per pound
1941	73	2,143	62,683	8,457	.07
1942	75	2,185	63,911	9,643	.11
1943	82	2,400	70,200	6,354	.11
1944	87	2,544	74,412	11,523	.12
1945	101	2,901	84,854	11,180	.13
1946	114	2,669	78,068	7,264	.20
1947	128	2,987	87,370	14,769	.17
1948	134	3,691	107,962	12,191	.19
1949 1/	148	4,060	118,755	-	-

1/ Preliminary estimate.
Compiled from official statistics.

Marketing and milling:

All rice imports and all sales of local rice are controlled by the Government through the activities of "del Banco Agro-Pecuario and Industrial" (the Agricultural and Industrial Bank of Panama). Although a tariff on imported rice was established in 1941 - now listed as 2.7 cents per pound on milled rice and 1.8 cents per pound on rough rice imports - this tariff is ineffective since the Agricultural and Industrial Bank is the only legal importer of rice.

The Bank supports rough rice prices at $6.00 per 100 pounds, the price established for the 1948 crop and maintained for the 1949 harvest. If rough rice is purchased by the Bank, it is milled in one of three large mills which it owns and operates. The wholesale ceiling price for milled rice in 1949 is fixed at $13.00 per 100 pounds.

Nearly all of the domestic rice is long-grain, mixed with Fortuna or Honduras varieties. Consumers, like those im Cuba, appear to prefer the long-grain, hard types but do not seriously object to a large percentage of broken grains. Grades are not used by the trade and all rice is sold "mill run," or as it comes from the polisher without separation of broken grains. Millers estimate that the average milling percentages of milled products from rough rice are as follows: whole rice, 40 percent; broken rice, 22 percent; bran, 8 percent; and hulls and waste, 30 percent.

Most of the 78 operating rice mills in Panama are relatively small and process only about 37 percent of the domestic crop. The remainder of the harvest is retained on farms, where it is consumed or saved for seed. The rice utilized on farms is nearly all hand-pounded as it is needed. A hollowed-out log and a heavy pole or mallet are used; the same equipment

that prevails in a large part of Asia. Many of the small-farm producers prefer the taste of stack-burned yellow rice and intentionally store the rough rice in such a way as to produce the desired results.

Production methods:

Panama traditionally has produced upland rice, cultivated and harvested by hand. About 90 percent of the 1948 and 1949 crops were grown in this manner. In general, production practices are the same as those in Colombia, Venezuela, Brazil and other countries of Latin America where upland rice is produced (see Foreign Agriculture Circulars FR 6-49 and FR 9-49). In Panama an average of three acres per farm is planted for each crop season and generally two crops are produced a year. Most of the rice is grown on rolling and steep land.

Beginning in 1941, rice producers began to experiment with some mechanization. They started to plow with tractors on fairly level lands and to seed with grain drills. Combines were introduced later, mostly the small tractor-pulled type. In general, these were not successful as they bogged down in the harvesting season. The grain-drill plantings were found to result in relatively low yields because they could not be weeded effectively.

Because of adverse weather conditions, rolling land, and a shortage of water for irrigation, Panama may not be able to compete in production with other countries such as Brazil and the United States where mechanization is adapted to the land and climate. As long as prices are relatively high and production is subsidized, however, mechanized production may be increased to some extent. Recent demonstrations have proved that rice can be produced in this manner. A wider use of mechanical production and milling equipment point toward a gradual improvement in the quality of Panama's rice.